Rule 021

Settlement System Code Rules

This rule as amended was approved by the Alberta Utilities Commission on ~~December 16, 2020~~October 15, 2026, and is effective on ~~December 17, 2020~~November 1, 2026.

Version 2.11~~0~~

This document can be referred to as version 2.11~~0~~ of ~~AUC~~ Rule 021: *Settlement System Code Rules*. Rule 021 is an operational document that defines the business processes and mechanics of how electrical energy settlement is to be carried out at the retail electricity market level in Alberta. Consequently, a consultative process is used to identify improvements and revisions that are to be made to Rule 021 to keep the rule relevant and reflective of the requirements of the retail electricity market.

A working group made up of industry representatives meets regularly to identify changes that are required to be made to Rule 021 and to assign priority rankings to the changes. Subgroups are formed to address the high-priority changes and to make recommendations to AUC staff. AUC staff incorporates any recommended changes into a draft version of a revised Rule 021. Stakeholders are then provided the opportunity to comment on the draft version to ensure the proposed wording and changes reflect the requirements of the industry. Commission approval is obtained for the revised rule once the industry comments are received and reviewed. Commission approval is sought by the end of the calendar year with implementation during the following year.

This lag between the approval date and the implementation date is to recognize that the approved revisions to Rule 021 will require industry stakeholders to make changes to their business processes and information technology systems in order to be compliant. The lag provides these entities the time to develop, implement and test their internal changes so that there is no disruption in the business processes once the revised changes are to take effect.

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1 Definitions

1.1 Key terms

abandoned oil and gas well site	Abandoned oil and gas well site is a site constructed as an oil and gas site or a lighting site affiliated with the oil and gas site located on rural lands where the original request for electricity service to the site, was not directly made or approved by, or made on behalf of, the then-registered owner of the rural lands.
aggregation	Aggregation is a collection of particulars into a whole mass or sum; total; combined.
Alberta time	Alberta time means Coordinated Universal Time minus six hours (UTC-6:00).
business day	A business day means any day other than Saturday, Sunday or a statutory holiday in Alberta, except for Easter Monday.
code	Code means this Settlement System Code (SSC) rules.
Commission	Commission means the Alberta Utilities Commission.
commissioned	The wire owner declaration of readiness of all relevant site equipment to perform all required wire owner functions.
customer	A customer has the meaning ascribed to the term "customer" in the *Electric Utilities Act.*
decommissioned	Revocation of commission status by the wire owner.
deemed profiles	Deemed profiles are pre-specified load shapes agreed to in advance. Commonly, this method has been used for loads, such as street lighting, with predictable, essentially flat shapes. However, a deemed shape could be developed for other applications based on engineering analysis and/or load shapes from other territories.
default supplier	Default supplier has the meaning ascribed to the term "default supplier" in the *Roles, Relationships and Responsibilities Regulation, 2003*.
direct-connect site	Direct-connect site is a transmission-connected site that meets the criteria described in Section 4.2.1(3).
distributed generation	Distributed generation has the meaning ascribed to the term "distributed generation" in the *Electric Utilities Act.*
dynamic estimation	Dynamic estimation is a profiling method using load research data from the day of interest.
grouped site	An arrangement of associated sites where data aggregation can occur and which must be enrolled or de-enrolled jointly. In the case of a micro-generation grouped site, the parent site is the site associated with the micro-generation generating unit with its own site ID, and any other associated site(s) is a child site with its own site ID. A child site ID is linked to a parent site ID. A micro-generation grouped site must meet the criteria of aggregated sites as stated in the *Micro-Generation Regulation*.

grouped streetlight	Virtual grouping of streetlights (which may be physically disparate) that is represented as a single site ID for billing and settlement purposes.
historical time standard	Historical time standard means the time convention applicable to a period of energy flow occurring before November 1, 2026, including the applicable standard-time or daylight-saving-time designation, daylight-saving-time transition rules, hour-ending identifiers, interval structure, and settlement-day structure.
ISO	ISO means the Independent System Operator as defined in the *Electric Utilities Act*.
large micro-generation	Large micro-generation has the meaning ascribed to the term "large micro-generation" in the *Micro-Generation Regulation*.
load profile	A load profile is a series of load or consumption amounts for each interval over a particular time period. In this document, the intervals are one hour, so that the profile may be considered either as an average load (kW) or total consumption (kWh) for each interval. The profile may be expressed either as the average per customer or as the total load for each interval.
load profile shape	A load profile shape is a normalized load profile. Specifically, the energy consumption in each interval (hour) is expressed as a fraction of the total energy consumption for the time span of the profile.
load settlement agent (LSA)	LSA means the party conducting load settlement calculations for a particular settlement zone.
load settlement intervals	Load settlement intervals are one-hour.
market participant	Market participant has the meaning given the term in the *Electric Utilities Act.*
measurement data	Measurement data is data that has been collected from meters, compensated and aggregated in accordance with the appropriate measurement point definition record (MPDR) and has been subjected to the required validation, estimation and editing (VEE) checks.
measurement point	Measurement point has the meaning ascribed to the term "measurement point" as defined by ISO in its Alberta Electric System Operator Measurement System Standard.
measurement point definition record (MPDR)	Measurement point definition record has the meaning ascribed to the term "measurement point definition record" as defined by ISO in its Alberta System Operator Measurement System Standard.
meter	Meter has the same meaning as given the term "meter" in the *Electric Utilities Act*.
metering point	Metering point has the meaning ascribed to the term "metering point" as defined by the ISO in its Alberta Electric System Operator Measurement System Standard.

meter data manager (MDM)	An MDM is the entity responsible for collecting metering data, correcting and validating interval metering data, storing historical data, and reporting load and consumption data together with corresponding time periods to appropriate parties.
metering data	Metering data is the data associated with a metering point.
metering system	A metering system includes all the metering equipment required for the measurement and, if applicable, remote storage of the active energy and reactive energy interval data for a single metering point.
micro-generator	Micro-generator has the meaning ascribed to the term "micro-generator" in the *Micro-Generation Regulation.*
month-at-a-time (MAAT) settlement	MAAT settlement is a process of conducting load settlement for all days of a calendar month at once.
Market Surveillance Administrator (MSA)	Market Surveillance Administrator has the meaning ascribed to the term in the *Electric Utilities Act*.
net system load shape (NSLS)	NSLS is the shape of a total load of a settlement zone, minus interval metered loads, deemed loads, loads based on specific load-research-based profiling classes and known losses.
point-of-delivery (POD)	A POD is a conceptual point of delivery from the transmission system. A POD is the point at which energy is deemed to be delivered from the transmission system to the distribution system. A POD is a collection of one or more measurement points.
point-of-supply (POS)	POS is a conceptual point of supply onto the transmission system. A POS is the point at which energy is deemed to be supplied to the transmission system.
profile cut-off date	Profile cut-off date is the date past which cumulative meter data received from the MDM cannot be used for calculating a settlement run.
profiling cap	A profiling cap or threshold is the size level above which a site is required to have interval-metering data.
profiling class	A profiling class is a group of sites that will be settled using a common load profile.
reactive power	Reactive power is the portion of electricity that establishes and sustains the electric and magnetic fields of alternating current equipment, usually expressed in kiloVArs (kVAr) or megaVArs (MVAr).
registered owner	Registered owner means the registered owner of a parcel of land in the register maintained by the Registrar of Titles under the *Land Titles Act.*
regulated rate provider	Regulated rate provider has the meaning given to the term "regulated rate provider" in the *Electric Utilities Act.*

retailer	Retailer either has the meaning given to the term "retailer" or the term "regulated rate provider" in the *Electric Utilities Act*, except in those cases where the "regulated rate provider" and the LSA, MDM or wire services provider (WSP) are different parts of the same organization and are not required to exchange transactions as per Section 7.1 of this code, in which case the term "retailer" in the *Electric Utilities Act* is the only one that applies.
retailer of record	Retailer of record is the single retailer (as defined above) that the load settlement system recognizes as serving a given site for a given day.
rural land	Rural land means a parcel of land, which is situated outside the boundaries of a city, town, village, summer village or a specialized municipality.
settlement ready data	Settlement ready data is data that is complete and ready for use in load settlement. Data shall be validated, estimated and edited as outlined in the standards and aggregated or totalized to measurement point data as per the MPDR.
settlement system	A settlement system is a computer system and associated operations and interfaces used to determine the load responsibility at each unit of the load settlement interval in accordance with Section 4.3, for each retailer operating within the settlement zone.
settlement timing	Settlement timing is the frequency at which load settlement is calculated and reported to the ISO and to retailers by the LSA.
settlement zone	The settlement zone is the collection of sites that are jointly settled by a settlement system.
small micro-generation	Small micro-generation has the meaning ascribed to the term "small micro-generation" in the *Micro-Generation Regulation*.
site	A site is a unique end-use service delivery point. This is the finest level at which load settlement recognizes retailer assignments and receives consumption data.
socket	A socket is normally a point at which a physical meter is installed, or a point at which a site load is calculated.
streetlight	An unmetered light source along a public highway (as defined in the *Hydro and Electric Energy Act*) that is controlled by a photo sensor and which may constitute one of a series.
system level	System level is measurement values needed to describe the total energy flow on the Alberta Interconnected Electric System (AIES) at the transmission level and the inputs and outputs to each and every distribution settlement zone for each hour. It includes measurements between the transmission system and the distribution system, distribution interchange, distributed generation and amounts delivered to or from border customers, but it does not include generation supplied by small micro-generation.
transmission-connected site	A transmission-connected site is a site that receives electric energy directly from the transmission system but that is not subject to an arrangement with the ISO to obtain system access service directly from the ISO under Section 101(2) of the *Electric Utilities Act*.

unaccounted-for energy (UFE)	UFE for each hour is the difference between (a) the system total load for the hour and (b) the sum of the allocated hourly loads at the customer meters, plus their allocated losses. All references to UFE in this code refer to UFE on electric distribution systems.
wire owner (WO)	Wire owner means the owner of an "electric distribution system" as that term is defined in the *Electric Utilities Act*.
wire services provider (WSP)	A WSP is a person authorized by an owner of an electric distribution system to act on behalf of that owner.

1.2 Common abbreviations

AIES	Alberta Interconnected Electric System
AUC	Alberta Utilities Commission
CT	current transformer
DCM	daily cumulative meter consumption to retailers and LSA transaction
DEC	de-energize completion to retailers and LSA transaction
DEF	de-energize failure transaction
DER	de-energize request transaction
DFO	distribution facility owner
DG	distributed generation – includes micro-generation
DI	distribution interchange
DIM	daily interval meter readings to retailers and LSA transaction
DSM	daily system measurement transaction
DSN	de-select notification transaction
DSR	de-select request transaction
EDG	excess distribution generation
ENC	energize completion to retailers and LSA transaction
ENF	energize failure transaction
ENR	energize request transaction
GCM	micro-generation cumulative meter reading to retailers transaction
GIM	micro-generation interval meter readings to retailers transaction
GRN	micro-generation retailer notification transaction
GRS	micro-generation retailer summary transaction
HE	hour-ending label
ID	identifier
LSA	load settlement agent
MAAT	month-at-a-time
MDM	meter data manager
MDP	meter data provider
MP	measurement point
MPDR	measurement point definition record
MSP	meter service provider
MSS	measurement system standard
NSLS	net system load shape
PFAM	post-final adjustment mechanism
POD	point-of-delivery
POS	point-of-supply
POT	point-of-transfer
PT	potential transformer
RAM	retailer adjustment to market transaction
RDS	revoke de-select request transaction
RDN	revoke de-select notification transaction
RDR	revoke de-energize request transaction
REA	rural electrification association
ROC	request off-cycle meter read completion transaction
ROR	request off-cycle meter read transaction
RRP	regulated rate provider
RSA	retailer specific adjustment transaction
RUC	request update to customer information transaction
SMC	site metering characteristics transaction
SPI	settlement profile information transaction
SRN	select retailer notification transaction
SRO	notify old retailer transaction
SRR	select retailer request transaction
SRW	LSA notify wires and MDM transaction
SSC	AUC Rule 021: Settlement System Code Rules

SSI	settlement summary information transaction
TA	transmission administrator
TAA	transmission administrator adjustment transaction
TBC	tariff bill code
TFO	transmission facility owner
TX	transmission
UCI	update customer information transaction
UFE	unaccounted-for energy
UTC	Coordinated Universal Time, Temps Universel Coordonné – the international time standard (formerly Greenwich Mean Time, or GMT). Zero hours UTC is midnight at 0 degrees longitude.
VEE	validation, estimation and editing
WO	wire owner
WSD	wholesale settlement detail for retailers own sites transaction
WSI	wholesale settlement information transaction
WSP	wire services provider
WSS	wholesale settlement summary transaction

1.3 List of acts and regulations cited

Alberta Utilities Commission Act, SA 2007, c. A-37.2, as amended
Electric Utilities Act, SA 2003, c. E-5.1, as amended
Micro-Generation Regulation, AR 27/2008, as amended
Regulated Rate Option Regulation, AR 262/2005, as amended
Roles, Relationships and Responsibilities Regulation, 2003, AR 169/2003, as amended
Transmission Regulation, AR 86/2007, as amended
Electricity and Gas Inspection Act, RSC 1985, c. E-4, as amended
Electricity and Gas Inspection Regulations, SOR/86-131, as amended

1.4 Interpretation

In this rule, the words “shall” or “must” indicate a requirement.

2 Responsibilities

2.1 Application

All market participants are required to comply with this AUC Rule 021: *Settlement System Code Rules* (code).

The following responsibilities are identified for load settlement agents (LSAs), wire services providers (WSPs) and meter data managers (MDMs). These functional distinctions, or others indicated in subsequent sections, identify separate roles, responsibilities and protections in cases where these functions are performed by separate entities. However, in cases where all these functions are performed within the same business entity, these terms are descriptive only and are not prescriptive of implementation flows within the bundled WSP acting as LSA for its own customers.

2.2 Load settlement responsibility

Generally, this code refers to load settlement as being a function of the WSP not the wire owner (WO). In most cases, the WO and WSP are the same. In cases where the WO does not select a WSP, this code considers the WO to be the WSP. In cases where the WO is not the WSP for its customers, this code assigns load settlement responsibility to the WSP. That is, the WSP not the WO will be the LSA in such cases.

2.3 Profile generation

Development of load profiles is an LSA function. This function includes:

(1) Calculation of the net system load shape (NSLS) profiles.

(2) Calculation of deemed profiles.

(3) Load research sample design and implementation.

(4) Generation of class profiles based on load research data using methods that satisfy the profile generation standards.

2.4 Site identification number catalogue

(1) A WSP must maintain an accurate and up to date catalogue of site identification numbers (site IDs), LSA identification numbers (LSA IDs) and the addresses where electricity service is provided (service addresses). A WSP must provide detailed service addresses which disclose the location of the site. A WSP must use either the civic or the rural address of the site unless such address does not exist. A civic or rural address must follow the Canada Post Addressing Guidelines.

(2) When a site is assigned a civic or rural address by the applicable municipal authority, a WSP must update the service address fields accordingly.

(3) The WSP must provide market participants 30 days' notice of a change in location of the catalogue on its website.

2.5 Customer information/de-select reason retailer responsibilities

(1) A retailer must maintain accurate and up to date customer and site contact information.

(2) A retailer must use the correct de-select reason code when notifying a WSP that it will no longer provide electricity services for the site.

2.6 Receipt of energize/de-energize requests

Energize and de-energize requests initiated by the customer or the retailer go from the retailer to the WSP. A WSP may energize or de-energize a site without a request from the retailer for reasons that include equipment testing, safety and requests from public protective services.

2.7 Estimating missing meter readings and consumption amounts

(1) Responsibility for filling in estimates for missing values in interval data series rests with the MDM as set out in Section 10.2.2.

(2) If MDM standards for no gaps in interval and POD level data are not met (see Section 9.6.1.1 and Section 2.7(1) above), LSAs can estimate missing intervals for interval and POD level data.

(3) The LSA shall estimate consumption amounts for cumulative meters where these are needed according to the following:

(a) Daily energy consumption of daily settlement (as described in Section 4.3).

(b) When an actual meter read is absent when any MAAT settlement is calculated.

(4) For a site for which there is no prior consumption history, the WSP is responsible for creating the initial estimate of energy consumption as per the WSP process.

(5) The MDM is responsible for estimating consumption amounts for cumulative meters according to the specific circumstances in Section 10.3.2.2.

2.8 Losses

(1) The LSA is responsible for calculating distribution losses, establishing the formulas for allocating those losses to sites and implementing those formulas as part of the load settlement process.

(2) Allocated losses are included in the hourly load calculated for each retailer by load settlement.

2.9 Disclosure and protection

The LSA shall make publicly available (on its website) the procedures and methods used to conduct load settlement, including formulas, common parameter values and system-level data. The LSA must also make available to individual parties data specific to those parties. The LSA shall not make publicly available data specific to individual parties.

2.10 Retailer of record

The LSA recognizes only one retailer of record for a particular site on a particular day and the LSA will only allocate energy to the retailer of record.

2.11 Estimation and liability for load settlement

Responsibility for conducting daily, monthly, interim and final settlements (as described in Section 4.3) is part of the WSP's mandated responsibility as the LSA. WSPs are not liable for the financial consequences of errors in estimates developed and provided to interested parties as part of their good-faith performance of these tasks.

2.12 Provincial reconciliation

The Independent System Operator (ISO) is responsible for reconciling the total provincial supply and load. To ensure the ISO can carry out this task, each stakeholder and market participant must provide any generation and load data to the ISO that the ISO requests.

2.13 Request for site ID numbers

(1) Retailers must provide a list of the customer's site IDs with the customer's bill or provide the site IDs in an electronic format to the customer at the time of the customer bill.

(2) Customer requests for the site ID must be responded to within two business days.

2.14 Review of load settlement processes

Each LSA is required to conduct an internal review of its load settlement processes within 30 calendar days of making a material change to those processes. This internal review is to assess the impact of the change(s) made and to verify the adequacy of such processes after such change(s). The LSA must document this assessment and findings, and retain such record. A copy of this record must be provided to the Commission and to the ISO upon request.

The Commission may conduct an audit to verify the adequacy and accuracy of any LSA's load settlement processes and calculations. The auditor's costs and expenses are to be payable by the LSA. The LSA shall give the auditor access to any documents and provide such information as the auditor may request to conduct the audit.

2.15 Timing of meter reads

Times refer to ~~times on~~ the applicable Alberta time or historical time standard for the period represented by the meter read, ~~prevailing local clock , standard or daylight time depending on the season,~~ using a 24-hour clock. The hours, minutes and seconds 23:59:59 refer to the second before midnight, and the next second is 00:00:00 of the next day.

Each WSP has the option of reporting the time of day for meter readings as the actual meter read time or as a consistently deemed meter read time between 00:00:00 and 23:59:59 on the date that the meter was read. The same deemed timing will apply to energize and de-energize.

2.16 Provision of copies of transactions to the ISO

Each market participant that provides a transaction identified in Section 9 of this code (excluding sections 9.6.2.4 and 9.6.6.4) to another market participant shall securely transmit a copy of that transaction on the same day to the compliance group of the ISO as per Appendix B.

2.17 Provision of load settlement–related data to the ISO

The ISO may request a market participant to provide it with any data related to load settlement. A market participant receiving such a request is required to deliver this data to the ISO within a reasonable period.

All data requests made by the ISO under these rules of any market participant shall also be copied to the Commission at the same time as the request is made.

2.18 Compliance monitoring by the ISO

The ISO is responsible for monitoring the following:

(a) Reports produced by MDMs and LSAs in accordance with the Section 11.

(b) All other market participants' self-reporting relevant to the code, including cumulative meter reading performance metrics reported in the AUC Rule 002: *Service Quality and Reliability Performance Monitoring and Reporting for Owners of Electric Distribution Systems and for Gas Distributors*.

(c) Compliance of market participants with the requirements of the code in general and particularly focusing on any areas of the code that the Commission may identify as a priority to the ISO.

If the ISO identifies non-trivial discrepancies between

(i) information contained in any reports prepared under sections 2.18(a) and (b) above and

(ii) copies of transactions as discussed in Section 2.16 above

the ISO must refer the matter to the Commission. For all other instances when the ISO suspects that a contravention has occurred, the ISO will refer the matter to the Commission.

2.19 Information requests

For the purpose of the Commission's oversight of this rule, the Commission may make a written request to the ISO for data or information relating to market participants that is held by or becomes available to the ISO pursuant to its mandate under the *Electric Utilities Act* or any other enactment, including any data or information that is created by the ISO from information or data provided by market participants, and the ISO must, as soon as practicable, provide that data or information to the Commission.

2.20 Transition of LSA/MDM/WSP

Any market participant who proposes to cause a change to the party performing the role and responsibilities of an LSA/MDM/WSP must provide written notice to each market participant that may be affected by the change. The written notice must be provided at least 90 calendar days prior to the date that the change is to take place. In addition to the written notice, both the current LSA/MDM/WSP and the new LSA/MDM/WSP designate must jointly submit a transition plan to both the AUC and to the ISO at least 60 calendar days prior to the effective date of the change. The transition plan must include the steps and processes to be carried out by the current and designated party to ensure that the transition of role and responsibilities will be done in a reasonable manner and will not disrupt the load settlement processes and other market participants' business processes or disrupt service to customers.

3 Load profiling methods

3.1 Profile generation methods

(1) Acceptable methods

(a) Net system load profile.

(b) Dynamic estimation from load research samples.

(c) Any load-research-based method that meets the accuracy standards defined in Section 8.

(d) Deemed profiles, limited to loads described under Section 3.1(3) below.

The accuracy requirements specified in Section 8 apply to profiling classes based on load research samples used for final settlement. The same profiling methods shall be used for monthly and interim settlement runs.

(2) Calculation of net system load shape (NSLS)

(a) Net system load (NSL)
Load settlement systems must have the capability to accommodate profiling classes split from NSLS, based on load research or deemed methods. The NSL shall be calculated for each hour as:

NSL = (Total system load) – [(Sum of interval metered customers) + (Sum of deemed loads) + (Sum of loads for load-research-based profiled classes) + (Sum of known losses)]

(b) NSLS
NSLS for a period is calculated by dividing the hourly NSL by the sum over hours in the period of the NSL.

(c) Known losses
The calculation of known losses for subtraction from the NSLS depends on the loss calculation procedures. As specified in Section 4.1, the procedures for calculating and allocating losses are to be determined by each LSA. One possible approach involves the calculation of the total system loss, with subsequent allocation of this total to customer groups based on the known or estimated loads of those groups. With this approach, the total system loss is known before the NSLS is calculated, but the losses associated with the individual load components subtracted to calculate the residual may not be. In this case, the total system loss is subtracted from the system load in calculating the residual. Another common approach is to develop a set of loss multipliers for different groups of customers and time periods. With this approach, the total system loss is not known prior to calculation and application of the residual profile, but losses for the load components subtracted from the system total are known. In this case, these known losses are subtracted from the residual.

(d) Total loads for load research-based profiling classes
For purposes of calculating NSL, the total load research-based profiling classes will be calculated by applying appropriate sample expansion factors (such as the ratio of population count to sample size) to the load research sample.

(3) Deemed profiles

(a) Regardless of what general load profiling method is used, the unmetered loads should be handled by a deemed shape and estimated consumption.

(b) The deemed shapes and magnitudes will be calculated by each LSA using its existing methods.

(c) Both metered and unmetered irrigation, gas and oilfield pumping accounts will be profiled using a deemed profile. For all other metered accounts, the energy amount will be based on meter readings.

3.2 Segmentation

(1) LSAs may not create new profiling classes. Each LSA will specify publicly the existing rate classes for which separate load research-based profiles may be provided.

(2) Procedures for creating new profiling classes may be developed in consultation with stakeholders, including WSPs, retailers and consumers.

(3) Retailers (or other market participants) will pay for the costs of creating those profiling classes they request.

3.3 Profiling cap

(1) The profiling cap is two megawatts (MW) or the WSP's current policy, whichever is lower. WSPs must specify their current policy publicly (on their websites).

(2) The WSP has an obligation to provide interval meters to customers who request them for as long as metering remains a WSP responsibility. Costs recovery terms are specified by each WSP's terms and conditions of service.

3.4 Customers with interval meters but below the profiling cap

The following rules apply to customers who have interval meters but are below the cap at which interval metering is required:

(1) If the customer is part of its profiling class load research sample, the customer is always settled according to the class profile, not according to its own interval data.

(2) If the customer is not part of its profiling class load research sample, the customer is always settled according to its own interval data, not according to the class profile.

3.5 Micro-generation customers with interval meters

(1) If the wire owner complies with the request of a small micro-generation customer to install a bi-directional interval meter, or if the customer's load is above the WSP's current profiling cap policy, the customer's micro-generation is deemed to be large micro-generation, and the customer's load is settled according to its own interval data.

(2) If the wire owner installs a bi-directional interval meter on a small micro-generation site for some reason other than the customer's request, it is deemed to be small micro-generation and the generation is excluded from load settlement calculations. The MDM is responsible for the micro-generation cumulative meter reading to retailers transaction (GCM) provision. In addition, notwithstanding Section 3.4(2), the customer's load is settled according to the class profile, not according to its own interval data. The MDM will provide cumulative site consumption using daily cumulative meter consumption to retailers and LSA transactions (DCMs) instead of interval data using daily interval meter readings to retailers and LSA transactions (DIMs).

4 Load settlement calculations

4.1 Loss calculations

(1) WSPs calculate losses and develop loss allocation formulas to be used in load settlement. Those who have been doing such calculations and developing loss allocation formulas as part of cost-of-service studies should continue to use similar methods to those they have been using. Those WSPs who have not conducted such calculations in the past (mainly smaller municipal WSPs) will calculate losses empirically from the difference between energy flow at the points of distribution and at the points of end use.

(2) Loss calculation procedures and specific factors used in the calculations will be clearly reported to retailers and to client WSPs at all times. Any changes to these procedures will be announced 90 days in advance to allow retailers reasonable time to adjust their supply and sales contracts.

(3) In cases where one WSP conducts load settlement on behalf of another WSP under the terms of Section 4.4, the loss calculation is the responsibility of the LSA. In particular, the WSP that conducts load settlement for a rural electrification association's (REA) customers, served by the WSP's PODs, is responsible for developing the loss allocation formulas that will apply to those customers. The loss calculation and allocation procedures in such cases must be transparent and must be applied consistently for all customers in the settlement zone. Consistency does not require that the same loss allocation parameters must apply to all customers, but that the form of the allocation and the basis for determining its parameters must be the same for all customers.

(4) When load settlement is performed by the LSA on behalf of another WSP, the loss calculation is subject to regulatory oversight. This oversight governs the confidentiality of data from the WSP used by the LSA and the fairness of the loss formulas developed by the LSA.

4.2 Unaccounted-for energy (UFE)

4.2.1 UFE allocation

(1) The calculated UFE for each hour will be allocated across all sites of all retailers in proportion to their settlement calculation of load, excluding UFE, but including allocated losses.

(2) Despite Section 4.2.1(1) above, sites that meet the following criteria will not be allocated UFE provided that:

(a) The energy flow to the site is calculated from the measurements of one or more interval meters.

(b) The same measurements and calculations, referred to in Section 4.2.1(2)(a) above, are used by the ISO to determine energy flow at a POD for transmission system access service.

(3) Sites that meet the criteria in Section 4.2.1(2) above are defined as direct-connect sites.

4.2.2 UFE monitoring

(1) UFE monitoring rules

(a) Testing for UFE reasonableness is to be done on daily averaged UFE data for all settlement runs in accordance with Section 4.3 for LSAs using the NSLS profiling methodology.

(b) For LSAs not utilizing the NSLS profiling methodology, testing and reporting will be on monthly average UFE data, and thereby excluding the daily reporting and testing requirement.

(c) When UFE is outside the tolerances described in Section 4.2.2(2), the LSA will investigate the variance and will report to the market on its website.

(d) LSAs shall report as described in Section 4.2.2(1)(c) above, within three business days of the provision of load settlement results.

(e) Errors identified as part of the investigation, shall be corrected prior to the next settlement run, or in accordance with other error-correction standards outlined in this code.

(2) UFE tolerances

(a) For UFE to be considered reasonable, and thus not requiring action by the LSA as described in Section 4.2.2(1)(c), daily or monthly average UFE for all settlement runs in accordance with Section 4.3, within each settlement zone, must fall within both the general UFE and settlement zone-specific UFE tolerances outlined below.

(b) General UFE tolerances: average daily or monthly UFE for all settlement runs and settlement zones must fall within the following tolerances to be considered reasonable:

Table 1. General UFE tolerances

Settlement run (in accordance with Section 4.3)	Daily average UFE tolerances (for NSLS profiling)	Monthly average UFE tolerances (for Non-NSLS profiling)
Monthly settlement	+ / - 5%	+ / - 5%
Interim settlement	+ / - 4%	+ / - 4%
Final settlement	+ / - 4%	+ / - 4%

(c) Settlement zone-specific UFE tolerances: average daily or monthly UFE must fall within the following tolerances around the average zone UFE for each settlement zone to be considered reasonable:

Table 2. Settlement zone-specific UFE tolerances

Settlement run (in accordance with Section 4.3)	Daily average UFE tolerances (for NSLS profiling)	Average Monthly UFE tolerances (for Non-NSLS profiling)
Monthly settlement	+ / - 4%	+ / - 4%
Interim settlement	+ / - 3%	+ / - 3%
Final settlement	+ / - 2%	+ / - 2%

(d) The average zone UFE for each settlement zone for a particular year will be determined every January of that year by the ISO utilizing the settlement data for such zone from the previous year and will then be made available to all market participants.

(3) Reporting requirements

(a) The UFE exception report, described in Section 4.2.2(5), shall be posted on the LSA's website in Adobe Acrobat format.

(b) The LSA shall provide one file for each settlement zone.

(c) The reports are to contain 12 months of rolling data for daily, monthly, interim and final settlement runs in accordance with Section 4.3.

(4) File naming convention

File names shall use the following naming convention:
LSA ID_ZoneID_UFEReporting.pdf

(5) UFE reasonableness exception report

The LSA shall provide the following information when UFE is found to be outside of the tolerances described in Section 4.2.2(2):

Table 3. UFE reasonableness report

UFE reasonableness reporting								
Last revision date:								
Period (Day / Month)	**Date Identified**	**TEST 1 General**	**TEST 2 LSA Average**	**Settlement Run (in accordance with Section 4.3)**	**Type of Error**	**Status**	**Date Resolved**	**Comments**
	Date Identified by the LSA	Outside of Overall Bound (mark with 'x')	Outside of LSA-specific bound (mark with 'x')	I=Daily M=Monthly R=Interim F=Final	S=System-level I=Interval C=Cumulative D=Deemed O=LSA Operational U=Unidentified	(1) Open – LSA (2) Open – Other (3) - Resolved	Date when LSA or other responsible party has resolved the issue	

4.3 Load settlement timing

4.3.1 General comments

(1) There are four settlement runs for each day of flow. The specific timing and data requirements for daily, monthly, interim and final load settlements are described below. For each day settled, the load settlement system will provide each of these four calculations of load settlement.

(2) LSAs shall publish load settlement results only once for each mandated settlement run.

(3) The ISO may order rerunning of monthly, interim or final settlement runs.

(4) New components of load settlement systems should be designed to accommodate quarter-hourly settlement data. An update of old components may be deferred until quarter-hourly results are required.

4.3.2 Daily settlement

(1) Daily settlement will be calculated utilizing the latest measurement data received as of 23:59 on the third business day following the day of flow. The LSA may choose to use cumulative meter reads in daily settlement.

(2) LSAs will provide daily settlement results to the ISO and retailers by 23:59 on the fifth business day after the day of flow.

4.3.3 Monthly settlement

(1) Monthly settlement will be calculated utilizing the latest measurement data received as of 23:59 on the seventh business day following the last day of the month to be settled.

(2) LSAs will provide monthly settlement results to the ISO and retailers by 23:59 on the 10th business day after the end of the month being settled.

4.3.4 Interim settlement

(1) Interim settlement will make use of consumption amounts for all completed meter reading periods as of 23:59 of the 12th business day of the second month following the month being settled, subject to the restrictions on profile cut-off dates and profile freezing described in Section 6. For customers for which a meter reading is not available covering all days to be settled, the energy consumption amounts will be estimated by the LSA as described in Section 2.7.

(2) The LSA will provide interim settlement results to the ISO and retailers by 23:59 on the 15th business day of the second month following the month being settled.

4.3.5 Final settlement

(1) Final settlement will make use of consumption amounts for all completed meter reading periods as of 23:59 of the fifth-last business day of the fourth month following the month being settled, subject to the restrictions on profile cut-off dates and profile freezing described in Section 6. For customers for which a meter reading is not available covering all days to be settled, the energy consumption amounts will be estimated by the LSA as described in Section 2.7.

(2) The LSA will provide final settlement results to the ISO and retailers by 23:59 on the second-last business day of the fourth calendar month following the month being settled.

4.3.6 Data revisions

Data revisions to date are incorporated at the monthly, interim and final settlement. No further data changes are incorporated after final settlement. LSAs are not responsible for tracking and storing data versions between monthly and interim settlement. LSAs store or maintain reproducibility for all the data used for each load settlement run: daily, monthly, interim and final.

4.4 Load settlement responsibility for WSPs

(1) Load settlement responsibility is assigned to the LSA which is a monopoly function of a WSP. A WSP is the LSA for all sites to whom its wires tariff applies that are eligible for enrolment with a retailer. In the case where a non-REA WSP's wires tariff applies to a site in addition to a REA's wires tariff, the non-REA WSP is the LSA for that site. The REA will provide consumption data and other site information to the LSA for load settlement and the LSA will provide aggregated load settlement information for the REA sites.

(2) Each WSP will assign all the sites for which it is the LSA to one or more settlement zones in accordance with its disclosures described in Section 11.1.1(4). A site can be assigned to one and only one settlement zone.

(3) Each WSP will subdivide its entire service territory into areas and assign each and every area to one and only one settlement zone so that each site in a settlement zone is located in an area assigned to the settlement zone. The areas assigned to a settlement zone are not required to be contiguous. A WSP may be the LSA for sites located in border areas

outside Alberta. For the purpose of assigning a WSP's service territory to settlement zones, these areas will be deemed to be part of the WSP's service territory.

(4) WSPs require regulatory approval to change the rules by which their service territory and the sites for which they are the LSA are assigned to settlement zones.

(5) The monopoly right and responsibility of one WSP to conduct load settlement for another WSP is subject to regulatory controls related to system transparency and information access and pricing of the load settlement service. Transparency of methods and procedures is a general requirement of the load settlement procedures. In particular, a client WSP must have access to load settlement-related information on its own customers.

(6) Data provided to the LSA by the client WSP for purposes of load settlement must be used by the LSA for settlement purposes only, unless the client WSP authorizes other uses.

4.5 Load settlement mechanics for special cases

4.5.1 Distributed generation

(1) Distributed generation includes all generation facilities connected to the distribution system capable of supplying energy onto the distribution system and includes but is not limited to wind power and small hydro and flare gas generation. Micro-generation is exempt from Section 4.5.1(2). Small micro-generation is also exempt from Section 4.5.1(3).

(2) All distributed generation sites must have interval metering to measure the energy supplied onto the distribution system, unless specifically excluded by the ISO. All distributed generation sites capable of consuming energy must have a site ID and a cumulative or interval meter. Specific metering configurations are at the discretion of each WSP. If the WSP does not own the metering systems, arrangements must be made by the distributed generation owner to deliver all data requirements defined by the WSP.

(3) The load settlement procedure for distributed generation is the following:

(a) For each metering interval, the MDM must determine if the site as a whole is consuming energy from the distribution system or generating energy onto the distribution system. When the site is consuming energy it is a net positive load. When the site is generating energy, it is net positive generation.

(b) For each settlement interval, net positive loads and net positive generation are each summed over the four metering intervals to give hourly net positive load (kWh) and net positive generation (kWh). These are the data provided to load settlement for the site.

(c) The hourly net positive generation is added to the POD totals as part of the zone load (ZPOD).

(d) The hourly net positive load is settled in the same way as for any other site.

4.5.2 Direct sales agreements

The LSA allocates the energy consumed at a site using the same methods as for any other site, whether or not the site has a registered direct sales agreement. Each site must have a retailer. The LSA will treat direct-seller sites connected to the distribution system as distribution generation sites.

4.5.3 Retailer decertification

(1) In the event that a retailer is decertified, the person responsible for the decertification will notify all WSPs promptly.

(2) The load settlement process is not affected by the decertification. The hourly loads will still be calculated for the decertified retailer. The settlement data for the decertified retailer will go to the retailer's receiver or designate.

(3) Customers who switch from the decertified retailer will be handled like any other switched customers.

4.5.4 Micro-generation

This section addresses load settlement for micro-generation sites.

(1) Micro-generation overview

(a) For all micro-generation sites:

(i) The site ID used to identify a unique end-use service delivery point will also be used to identify a micro-generation site.

(ii) Micro-generation sites are subject to retailer enrolment based on existing code procedures and transactions that reference site ID. (Micro-generation is not enrolled and de-enrolled separately from the site.)

(iii) Micro-generation sites are subject to energization and de-energization based on existing code procedures and transactions that reference site ID. (Micro-generation is not energized and de-energized separately from the site.)

(iv) In the event the retailer receives written confirmation from the micro-generation customer, the retailer will make a micro-generation retirement request to the WO. The WO will follow up according to its practices, issue a micro-generation retailer notification transaction (GRN) indicating the micro-generator's site is decommissioned and change the micro-generation indicator for the site in the site ID catalogue transaction (SID).

(v) The WO will indicate which sites are commissioned micro-generation sites using the SID.

(b) For large micro-generation sites:

(i) There is a one-to-one relationship between site ID (load) and asset ID (generation) for micro-generation. Neither changes are allowed once assigned to the site.

(ii) The MDM will provide interval data to the LSA and ISO using daily system measurement transactions (DSMs).

(iii) The MDM will provide interval data to retailers using micro-generation interval meter readings to retailers transactions (GIMs).

(iv) There is no requirement for retailers to provide information to the ISO to enable the ISO to credit retailers for large micro-generation.

(v) Large micro-generation is subject to the same post-final adjustment mechanism (PFAM) rules applicable to system-level errors, per Section 5.2.3(3).

(c) For small micro-generation sites:

(i) The MDM will provide cumulative data to retailers using GCM transactions.

(ii) Small micro-generation is not subject to PFAM rules as it is not included in load settlement. For small micro-generation errors identified by the MDM or the LSA, the MDM must cancel and replace the data provided previously per sections 9.6.1.4 and 9.6.6.4; for errors identified by other parties, the PFAM application form shown in Appendix A can be completed and submitted to the LSA to initiate the correction process.

(iii) For a site that switches retailers between two meter readings, each retailer will determine the energy supplied out of the site while the site was enrolled to them by pro-rating the energy supplied out of the site in the meter reading period in proportion to the number of days the site was enrolled to them in accordance with the MDM's published deemed time rules.

(iv) Cumulative meter reads are not required on monthly boundaries. Although there is no requirement for both sites' load and generation meter registers to be read on the same day, WOs must make reasonable effort to take reads from all cumulative micro-generation sites at least once in each calendar month.

(v) The MDM shall provide data in GCM records as specified in Section 9.6.1.4 to retailers no later than the eighth business day from the date of the meter read.

(d) At the request of a retailer, the LSA will enrol a grouped site together with one retailer:

(i) A grouped site is identified by the Cluster Correlation Key field (sequence 38 of the SID transaction)

(ii) A parent site has its own site ID in the Cluster Correlation Key field

(iii) A child site has its parent site ID in the Cluster Correlation Key field

(e) In the event of a new site addition to a grouped site, the LSA must ensure the site is enrolled with the same retailer as the grouped site to which it is added

(f) With the exception of a new site addition to a grouped site, if an enrolment or de-enrolment request is received without an enrolment or de-enrolment request for all sites in a grouped site at the same time within the same file, the LSA will reject an enrolment or de-enrolment request with a transaction status code of 0019 – Incomplete grouped site information (Table A-8)

(g) The WSP must notify the retailer of record and the micro-generator following any changes to a grouped site by email, or other previously agreed upon method.

(2) Micro-generation setup processes

(a) For all micro-generation sites:

(i) The micro-generation customer fills out an application form (with site ID) and provides it to the WO. The WO returns the application to the micro-generator who can use the approved application form to notify their retailer.

(b) For large micro-generation sites:

(i) Micro-generation applications are sent by the WO to the ISO who returns it to the WO with the assigned asset ID.

(ii) The ISO will develop MPDRs for large micro-generation.

5 Settlement error correction

5.1 General

Procedures for the identification and correction of errors pursuant to the code are set out below. No party may opt out of specific requirements and procedures herein pertaining to code-related disputes.

5.2 Post-final adjustment mechanism (PFAM)

5.2.1 Scope

(1) PFAM is the means by which a retailer of record receives an ISO financial adjustment for errors identified after final settlement.

(2) The LSA is responsible for identifying changes to data (e.g. meter reads, changes to energization status, meter multiplier changes, etc.) affecting periods already final settled and then initiating the PFAM process as described in Section 5.2.3 where applicable.

(3) While the majority of errors will be identified and PFAMs processed by the LSA, there may be instances where the PFAM process will be initiated by the following participants: retailers, MDMs, WOs, WSPs and the ISO.

(4) System-level errors may be adjusted through the PFAM process.

(5) PFAM adjustments will not result in revised wholesale settlement detail for retailers own sites transaction (WSD) data or any other output of load settlement.

(6) These PFAM processes shall be applicable to large micro-generation transactions dated January 1, 2009, or later.

5.2.2 Communications

(1) Each participant utilizing the PFAM process shall designate one individual as its primary contact point for PFAM communications.

(2) The LSA in each settlement area shall act as the conduit for the handling of PFAM claims. In all cases, the relevant LSA shall receive communications from each claimant party (complainant) and shall send all relevant communications back to the complainant, in accordance with the provisions of this code.

(3) Each LSA shall ensure that systems and procedures are established and maintained within their operations sufficient to track and process PFAM error claims on a timely basis in accordance with the provisions of this code.

(4) Notwithstanding the exclusion from the load settlement in Section 4.5.4(1)(c), the LSA shall act as the conduit for handling of small micro-generation dispute claims.

(5) Each market participant shall ensure that systems and procedures are established and maintained within its operations sufficient to track and process small micro-generation dispute error claims on a timely basis.

5.2.3 Materiality threshold and process

(1) For site-level errors identified by the LSA

(a) Each LSA shall monitor its settlement system for changes to the data affecting periods already final settled. When such changes are identified, the LSA will identify the net difference between the consumption final settled and the consumption that would have been settled had the updated information been provided to the LSA prior to final settlement.

(b) Where the net difference in consumption identified as per Section 5.2.3(1)(a) above is plus or minus 100 kWh or greater, the LSA shall allocate the net difference to hourly intervals and prepare a retailer specific adjustment (RSA) transaction set as per Section 5.2.5(3)(a). The LSA has the option of preparing and submitting the RSA transaction sets at the same time the changes to the data are identified or of preparing and submitting them monthly in time for the ISO final statement as per Section 5.2.7(1).

(c) In order to ensure that the LSA has had sufficient time to process the RSA transaction set, parties other than the LSA should withhold submitting a PFAM application form after identifying an error until the LSA is able to process the RSA transaction set as per the LSA's processes and timelines.

(2) For site-level errors identified by parties other than the LSA

(a) Claimed PFAM errors must be submitted by the complainant to the LSA responsible for the relevant settlement area, using the PFAM application form shown in Appendix A. The form shall be submitted electronically, in prescribed format and with all required information.

(b) Upon receipt of a PFAM application form, the LSA will assign a unique PFAM reference number to the claim for tracking and processing purposes.

(c) The LSA must send an electronic receipt-notice to the complainant within two business days of receiving the form. The receipt notice will include the PFAM reference number assigned to the claim, will confirm that the claim form has been received, will advise whether sufficient preliminary information has been submitted in relation to the claim and, if sufficient information has been included, will advise whether the LSA or some other specified party will be handling the investigation and assessment of the claim.

(d) Where the submitted form is incomplete or otherwise lacks information required to commence an investigation of the claimed error, the LSA, after advising the complainant of the deficiency, shall not be required to take any further steps in respect of the claim unless a completed form is received.

(e) A PFAM application form resubmitted by a complainant to address any format or information deficiency shall carry the PFAM reference number initially assigned by the LSA in respect of the relevant claim.

(f) The investigating party shall complete the investigation of the claim in no more than 30 days following receipt of the claim. Where the investigating party is unable to comply with the specified timing, it must request an extension from the ISO.

(g) Identification of investigating party

(i) Upon receipt of a PFAM application form in prescribed format and with all information required to commence investigation of error claim, the LSA shall make an initial determination as to whether the claimed error falls directly within the settlement responsibilities of that LSA or of some other party; responsibility for investigation of the claimed error shall rest with the investigating party, as determined by the LSA.

(ii) Where the claimed error pertains to load settlement responsibilities of that LSA, then the LSA shall be responsible for investigation and assessment of the claim.

(iii) Where the claimed error pertains directly to load settlement responsibilities of a party other than the LSA, then the LSA shall immediately refer the claim to the relevant party for investigation and assessment of the claim. The LSA is not responsible for the action or inaction of that other party.

(iv) The assessment in respect of a claim shall be referred to as the determination.

(v) The investigating party, where other than the LSA, may at its discretion communicate directly with the complainant for the purposes of investigation of the claim; however, the determination in respect of the claim shall in all cases be communicated to the LSA, which shall then in turn communicate the determination to the complainant accordingly.

(vi) All error claims shall be investigated and assessed, and the determination communicated back to the complainant on a timely basis following the receipt of the PFAM application form in prescribed format and content by the LSA.

(h) Discretion of investigating party

The investigating party shall have the primary responsibility and discretion for rendering a determination as to whether the claim of error is valid and to what extent, and whether it should be addressed through the PFAM process, in accordance with the provisions of the code.

(i) Investigating party disagrees with claim

Where the investigating party disagrees that the claimed error should be processed through PFAM in some fashion, such determination shall be documented by the investigating party and provided to the LSA, and the claim shall be refused on that basis. The LSA shall communicate the determination and the basis for the assessment to the complainant who submitted the error claim, by completing and returning the relevant PFAM application form as applicable.

(j) Investigating party agrees with claim

(i) Where the investigating party agrees that the claimed error should be processed through PFAM, such determination shall be documented by the investigating party and provided to the LSA, and the claim shall be accepted to such extent on that basis. The LSA shall communicate the determination and the basis for this assessment to the complainant who submitted the error claim, by completing and returning the relevant PFAM application form as applicable.

(ii) In accordance with the determination accepting the claim, and where the determination reveals a net difference between the kWh final settled and the kWh that would have been settled at final settlement had the correct information been provided to the LSA, and that net difference is plus or minus 100 kWh or greater, the LSA shall allocate the net difference to hourly intervals and prepare an RSA transaction set as per Section 5.2.5(3)(a).

(iii) The agreed PFAM adjustment(s) shall be forwarded to the ISO by the LSA. Any determination agreed to by the LSA or communicated to the LSA by the investigating party thirteen business days prior to the ISO's final statement issue date must be sent to the ISO not less than eight business days prior to the ISO's final statement issue date.

(k) LSA to notify affected parties

In all cases where the claim has been dismissed, rejected or accepted, the LSA shall ensure that all other parties affected by the determination of the claim are duly notified in writing. Such written communication may be in electronic form.

(l) Proof of notification

In all circumstances, the onus of proof of required communication of the determination to the complainant and other affected parties shall rest with the LSA.

(3) For system-level errors

(a) When the MDM identifies errors in large micro-generation data affecting periods already final settled, and where the net difference resulting from those errors is plus or minus 100 kWh or greater, the MDM shall notify the ISO and the LSA and submit revised DSM records as per Section 9.6.2.4.1 and revised GIM records as per Section 9.6.1.2.

(b) When the MDM identifies errors in system-level data (other than large micro-generation data) affecting periods already final settled, and where the net difference resulting from those errors is plus or minus 100 MWh or greater, the MDM shall notify the ISO and the LSA and submit revised DSM records as per Section 9.6.2.4.1.

(c) For system-level errors meeting the criteria set out in either Section 5.2.3(3)(a) or (b) above, the LSA shall prepare the transmission administrator adjustment (TAA) transaction set as per Section 5.2.5(3)(b).

5.2.4 Dispute resolution

(1) Where the complainant or any other affected party does not agree with a determination in respect of a claim, they may contact the ISO to seek resolution. If the complainant wishes to dispute the ISO's determination, the complainant may request a review by the Commission. The Commission will then make a final determination.

(2) The PFAM adjustment transaction specified by the investigating party and communicated by the LSA to the ISO will be processed through PFAM at the time of determination, but may be subject to later review if the dispute resolution process is invoked.

(3) If the complainant or any other affected party wishes to dispute the determination, they must notify the LSA as to the details of their dispute in writing, within 10 business days immediately following receipt of the determination.

5.2.5 Processing of PFAM adjustments

PFAM adjustments require retailer adjustment to market (RAM) transaction sets and RSA transaction sets or TAA transaction sets, depending on whether the PFAM adjustment results from a site-level or system-level error, respectively. The PFAM adjustments may be either positive or negative. If there are multiple PFAM adjustments required in a given month in a given settlement zone, only one RAM transaction set is required. A RAM transaction set is the means by which the LSA communicates each retailer's share of the total zone energy

consumption, line loss and UFE during the most recent final settlement run to the ISO so that the ISO can calculate the RAM adjustment. The RAM adjustment is each retailer's share of the amount required to offset the financial impacts of the total RSA and TAA transaction sets in a given month.

(1) The LSA is responsible for preparing RSA, TAA and RAM transaction sets, as specified in Section 5.2.5(3) below, as applicable, and for submitting those transaction sets to the ISO.

(2) The ISO:

(a) Receives the transaction sets and determines the total financial impacts to each retailer of all of the RSA and TAA transaction sets in any given month by applying the historical hourly ISO pool price to each interval eligible for financial adjustment and summing the results by retailer.

(b) Determines how the total financial impacts resulting from RSAs and TAAs are to be offset using the RAM transaction set as the basis. The offsetting financial adjustments are RAM adjustments.

For example, if only one PFAM was processed in a given month and that PFAM meant that a retailer would be receiving a credit adjustment of *x* dollars for a given site, all the retailers operating in the settlement zone would need to collectively pay *x* dollars to cover the credit adjustment. The ISO determines the share each retailer must pay so that all of the shares add up to *x* dollars. In order to determine the share to be paid by each retailer, the ISO uses each retailer's portion of the total of the consumption, line loss and UFE for all of the zone (excluding that from direct-connect sites) that each retailer was responsible for in the most recent final settlement run performed by the LSA. The RAM transaction set provides the total of the consumption, line loss and UFE by retailer to allow the ISO to calculate the allocation of the RAM adjustments to each retailer to offset the total financial impacts of the various RSA and TAA transaction sets throughout the month.

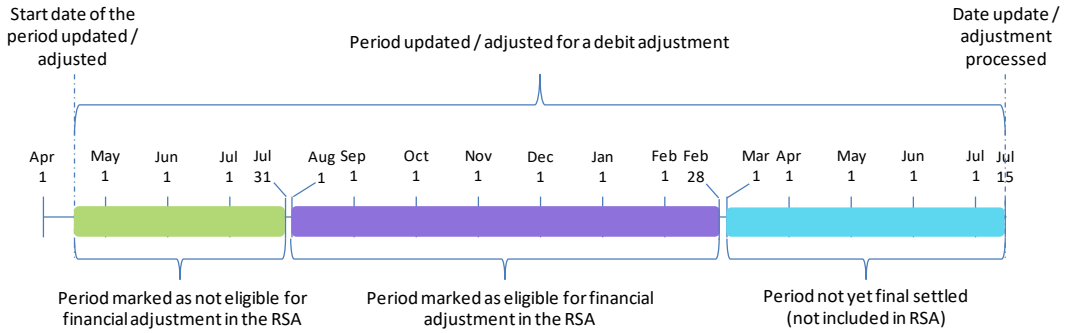
(3) The following transaction sets are all part of the PFAM adjustment set: RSA, TAA and RAM, as set out below.

(a) RSA transaction set

For errors meeting the criteria set out in sections 5.2.3(1)(b) or 5.2.3(2)(j)(ii):

(i) Where the total kWh final settled is less than the total kWh that would have been settled had the correct information been provided to the LSA prior to final settlement (debit PFAM adjustment), the LSA will mark all intervals as eligible for financial adjustment except those intervals of a date prior to the first day of the month that is 11 months prior to the date the RSA will be published to market (see Figure 1. Example of debit PFAM adjustment below).

Figure 1. Example of debit PFAM adjustment



(ii) Where the total kWh final settled is greater than the total kWh that would have been settled had the correct information been provided to the LSA prior to final settlement (credit PFAM adjustment), the LSA will mark all intervals as eligible for financial adjustment except those intervals of a date prior to the first day of the month that is eight years prior to the date the RSA will be published to market.

(iii) The RSA transaction, as specified in Section 9.6.6.1, identifies the specific hourly adjustment to energy for each retailer, and each adjustment may be either positive or negative. The RSA amount will be applied to the retailer of record for the site at the time of the error.

(iv) Customers directly connected to the transmission system as described in Section 4.2.1(2) of the code (direct-connect sites) are eligible for RSAs or TAAs, depending upon the nature of the adjustment.

(b) TAA transaction set

For errors meeting the criteria set out in sections 5.2.3(3)(a) or (b):

(i) The TAA, as specified in Section 9.6.6.3, identifies system-level meter errors that have been brought forward to the PFAM process. The LSA has the option of preparing and submitting the TAA transaction sets as errors are identified or of preparing and submitting them monthly in time for the ISO final statement as per Section 5.2.7(1). The ISO will then make the necessary adjustments in billings to the transmission line losses; such adjustments may be either positive or negative.

(ii) Customers directly connected to the transmission system as described in Section 4.2.1(2) of the code (direct-connect sites) are eligible for RSAs or TAAs, depending upon the nature of the adjustment.

(c) RAM transaction set

In order to allow the ISO to calculate the correct RAM adjustments for retailers, the LSA shall provide via the RAM transaction, on a monthly basis, the total zone energy consumption, line loss and UFE by retailer for the appropriate settlement month most recently final settled, excluding that from direct-connect sites. The RAM transaction provides the required information to allow the ISO to calculate the RAM adjustment.

(i) The RAM transaction, as specified in Section 9.6.6.2, identifies the total of the energy consumption, line loss and UFE for all sites of each retailer, excluding direct-connect sites, that each retailer was responsible for in the most recent final settlement run performed by the LSA. The LSA shall prepare and submit RAM transaction sets in time for the ISO final statement as per Section 5.2.7(1).

(ii) RAM adjustments are not disputable through the PFAM process as they are the aggregate adjustments for post-final errors.

5.2.6 Transaction mechanism and file format

The RSA, RAM and TAA transactions will be provided to the ISO in comma-separated value (CSV format) by the LSAs, using the ISO ID for financial settlement purposes as described in Section 9.4.6.9. Each retailer's specific RSA transaction sets will also be sent to retailers by the LSAs in CSV format as per Appendix B.

5.2.7 Financial adjustments

(1) PFAM adjustment transactions submitted by the LSA to the ISO eight business days prior to the ISO final statement issue date will be included on the ISO's final statement. Where this timeline is not met, the adjustment will be made on the following month's final statement from the ISO.

(2) The ISO shall accept the PFAM adjustments submitted by the LSA and apply the relevant historical ISO pool prices to the data in order to arrive at the applicable financial adjustments.

(3) The financial adjustments and allocations will be included on the relevant ISO statements in accordance with the provisions of the ISO Rules.

6 Functional requirements of the core load settlement calculation

The sections listed below define the required inputs and outputs of load settlement. These sections do not dictate how load settlement algorithms or calculations should be implemented. Any implementation approach that produces outputs mathematically equivalent to the outputs defined below is acceptable.

6.1 Data versions and revisions

(1) These rules define load settlement outputs for a given settlement zone for a given hour of energy flow (hour *t*) for settlement run as at date and time T. As at means using the most recent version of data in the load settlement input database at date and time T. Timing rules for daily, monthly, interim and final settlement which define acceptable values of the database date and time used to calculate settlement T for a given hour of energy flow *t* are specified in Section 4.3.

(2) An exception is made to the data revision rules in Section 6.1(1) above for load profiles and profiled sites. All profiles for a given hour of flow *t* must be frozen on their first usage for each settlement run type published; that is, the profile may not be revised for that settlement run type and hour of flow, even when input data used to calculate the profile, such as POD loads and interval metered loads, are revised for the other settlement computations. To allow sufficient time to finalize these profiles, load settlement generates and uses the profiles only up to a profile cut-off date. Because profiles are not used for days of flow past the profile cut-off date, cumulative meter reads that cover dates past the profile cut-off date cannot be profiled, and such sites are treated as though the cumulative meter reads were missing for that settlement run; however, such reads may be used in subsequent settlement runs subject to the same cut-off rules.

The profile cut-off dates are as follows:

(a) For daily settlement, the end of the last calendar day of the period being settled.

(b) For monthly settlement, the end of the last calendar day of the month being settled.

(c) For interim settlement, the end of the last calendar day of the calendar month following the month being settled.

(d) For final settlement, the end of the last day of the third calendar month following the month being settled.

(3) If daily, monthly, interim and final settlement profiles are identical, an LSA may choose to profile a meter read that covers dates past the profile cut-off date by using the latest published profile from any settlement run. Any LSA electing to use this approach must notify industry according to Section 2.9. LSAs intending to change approach must notify the AUC 120 days in advance of the change.

6.2 Assumptions

These calculation formulas assume that:

(1) Energization and de-energization of a site are always accompanied by a meter read on the same day. This assumption simplifies the definition of profiled loads. Switch of retailer is not assumed to be accompanied by a meter read on the same day.

(2) The WSP is not required to perform a meter read at the time of a change of profile class. In the absence of such a read, the LSA must make appropriate adjustments to the calculations specified below. The calculations are presented with the simplifying assumption of meter reads at profile class change for ease of exposition.

(3) There are no missing interval meter read consumption (kWh) values in the load settlement input database. "Missing" means no interval meter read (kWh) for hour t for an entity in the zone that is interval metered at hour *t*. Interval metered entities include PODs, distributed generators, interval metered customer sites, unmetered sites with deemed interval consumption values and profile sample sites. Filling in or "plugging" of missing or deemed interval meter reads is assumed to occur prior to entry into the load settlement input database referenced here.

(4) There are missing cumulative meter read consumption values in the load settlement input database due to variations in cumulative meter reading frequency.

6.3 Load settlement inputs and outputs

(1) Inputs

(a) Inputs to the load settlement system include the following:

(i) Information on each site to be settled, including status flags and interval and cumulative consumption data.

(ii) POD interval data and Adjustments required to POD data.

(iii) Load research profile data if any profiling classes other than NSLS are used.

(iv) Deemed profile data.

(b) The standard external transactions, stated in Section 9, identify the critical information that must be transferred between external parties to support the load settlement process. Individual LSAs may require additional inputs to support their specific methods of performing the load settlement function.

(2) Outputs

(a) Reporting requirements from the load settlement system are to include the following:

(i) Basic ISO invoice requirements.

(ii) Sufficient detail for retailers to reproduce interim and final settlement calculations for their own customers. The WSP supplier tariffs will determine the prices charged to retailers for information other than what the ISO requires.

(iii) Publicly available diagnostics will include general formulas, aggregate statistics on UFE and losses, and the settlement zone sum of POD loads. No retailer-specific information will be part of the publicly available diagnostics.

(iv) Site-specific breakdown of load settlement results on a daily basis for retailer's own sites.

(b) Specific calculation reporting requirements are described in Section 6.4.

6.4 Required load settlement reports

6.4.1 Elements required for reporting

The following elements must be reported by load settlement system. Reporting to the ISO includes all the zone elements and all the retailer elements for each retailer. Reporting to each retailer includes all the zone elements and all the retailer elements for that retailer only.

(1) $ZPOD_{tT}$ = Zone load which is determined by netting the hourly energy that:

- enters the settlement zone at the system level through PODs, distributed generators (excluding small micro-generation), distribution interchange import points with other settlement zones, isolated community generation and extra-provincial suppliers of border customers
- leaves the settlement zone at the system level through distribution interchange export points with other settlement zones and transmission substations to the transmission system

Zone load for a settlement zone is intended to be the total of:

- the hourly energy consumed by all sites within the settlement zone
- the hourly distribution energy loss incurred within the settlement zone to serve the sites within the settlement zone
- the hourly distribution energy loss incurred within the settlement zone to serve sites in other settlement zones through distribution interchange export points
- the hourly distribution energy loss incurred or saved to serve distributed generators
- less small micro-generation

Due to limitations in determining the hourly zone load, distribution loss and total site load for a settlement zone, the sum of the calculated distribution loss and total site load for the settlement zone will never exactly equal the zone load calculations. The difference is defined as UFE which can be positive or negative. UFE is allocated by the LSA to the sites within the settlement zone as specified in Section 4.2.1.

(2) $ZLOAD_{tT}$ = Sum of retailer-settled loads, excluding loss and UFE allocations, in hour *t* for the zone

(3) $ZLOSS_{tT}$ = Zone total distribution loss in hour *t*

(4) $ZUFE_{tT}$ = Zone total UFE in hour *t*

(5) $RLOAD_{rtT}$ = Retailer total settled load, excluding loss and UFE allocations, in hour *t* for retailer *r*

(6) $RLOSS_{rtT}$ = Retailer total allocated distribution loss in hour *t* for retailer *r*

(7) $RUFE_{rtT}$ = Retailer total allocated UFE in hour *t* for retailer *r*

6.4.2 Definition of required elements

As noted above, these definitions are descriptive, not prescriptive. Any implementation that provides equivalent mathematical relationships among the elements is acceptable. The required elements are defined as follows:

(1) Zone load as delivered to sites

$$ZLOAD_{tT} = \sum_{r \in R_{tT}} RLOAD_{rtT}$$

where

RtT is the set of all retailers with enrolled sites in the zone at hour *t* as at time *T*.

(2) Zone losses

$$ZLOSS_{tT} = \sum_{r \in R_{tT}} RLOSS_{rtT}$$

The zone loss $ZLOSS_{tT}$ may be calculated as the sum of separately determined retailer losses $RLOSS_{rtT}$, as indicated in this formula. Alternatively, the total zone loss $ZLOSS_{tT}$ may be calculated first, then allocated to retailers. In either case, the zone loss must equal the sum of the retailer losses.

(3) Zone UFE

$$ZUFE_{tT} = ZPOD_{tT} - ZLOAD_{tT} - ZLOSS_{tT}$$

(4) Retailer load as delivered to sites

$$RLOAD_{rtT} = \sum_{s \in E_{rtT}} SLOAD_{stT}$$

where

E_{rtT} is the set of all sites enrolled with retailer r in the zone at hour t as at time T

$SLOAD_{stT}$ is the settled load of site s in hour t as at time T.

(5) Retailer loss

$$RLOSS_{rtT} = \sum_{s \in E_{rtT}} L_{stT}(SLOAD_{stT})$$

where

L_{stT} is the distribution loss function for site s at hour t as at time T.

(6) Retailer UFE

(a) If all sites within a zone receive UFE allocation or all sites within a zone do not receive UFE allocation, the following formula is applicable:

$$RUFE_{rtT} = ZUFE_{tT} * (RLOAD_{rtT} + RLOSS_{rtT}) / (ZLOAD_{tT} + ZLOSS_{tT})$$

(b) In all other instances, the following formulas are applicable:

Site UFE

$$RUFE_{rtT} = \sum_{s \in E_{rtT}} SUFE_{stT}$$

where

$$SUFE_{stT} = ZUFE_{tT} * \frac{\left(WUFE_{stT} * (SLOAD_{stT} + L_{stT}(SLOAD_{stT})\right)}{\sum_{s \in S}\left[WUFE_{stT} * \left(SLOAD_{stT} + L_{stT}(SLOAD_{stT})\right)\right]}$$

$$WUFE_{stT} = \begin{cases} 0 \text{ if UFE is not to be allocated to site } s \text{ at hour } t \text{ as at time } T \text{ as per Section 4.2.1(2),} \\ 1 \text{ otherwise} \end{cases}$$

and S is the set of all sites s in the zone.

(7) Site load

$$SLOAD_{stT} = \begin{cases} ULOAD_{stT}, & \text{IF site } s \text{ is on a deemed profile at hour } t \text{ as at time } T; \\ ILOAD_{stT}, & \text{IF site } s \text{ is interval metered at hour } t \text{ as at time } T; \\ PLOAD_{stT}, & \text{IF site } s \text{ is cumulative metered at hour } t \text{ as at time } T; \end{cases}$$

where

$ULOAD_{stT}$	is the deemed load for site s at hour t as at time T
$ILOAD_{stT}$	is the interval-metered load for site s at hour t as at time T
$PLOAD_{stT}$	is the profiled load for site s at hour t as at time T.

(8) Profiling class load

$CLOAD_{ptT}$ = Profile kWh for profiling class p at hour t as at time T.

If p is a profiling class using class load research for the profile, $CLOAD_{ptT}$ is the estimate of total class load at hour t based on the load research data and estimation/expansion procedures.

If the profiling class p is the set of sites profiled using the NSLS, $CLOAD_{ptT}$ is the total net system load, calculated as

$$CLOAD_{ptT} = RESIDUAL_{tT}$$

$$= ZPOD_{tT} - \sum_{s \in U_{tT}} ULOAD_{stT} - \sum_{s \in I_{tT}} ILOAD_{stT} - \sum_{p' \in L_{tT}} CLOAD_{p'tT} - KLOSS_{tT}$$

where

U_{tT}	is the set of all sites in the zone that are assigned a deemed profile at hour t as at time T
I_{tT}	is the set of all sites in the zone that are interval-metered at hour t as at time T
L_{tT}	is the set of load research-based profiling classes at hour t as at time T
$KLOSS_{tT}$	is the estimated loss at hour t as at time T associated with known loads.

(9) Loss associated with known loads

If the total zone loss $ZLOSS_{tT}$ is calculated first, then allocated to retailers, the loss associated with known loads is the total zone loss:

$$KLOSS_{tT} = ZLOSS_{tT}$$

If the total zone loss $ZLOSS_{tT}$ is calculated by applying loss formulas to load components and summing these component losses, the loss associated with known loads is the sum of the loss formulas evaluated for the known components (deemed, interval-metered and load research-based profiling classes):

$$KLOSS_{tT} = \sum_{s \in U_{tT}, I_{tT}, L_{tT}} L_{stT}(SLOAD_{stT}).$$

(10) Calculating load profile shapes

$$PROFILE_SHAPE_{ptTab} = \frac{CLOAD_{ptT}}{\sum_{t'=a}^{b} CLOAD_{pt'T}}$$

(11) For profiling classes p whose profiles are either the NSLS or based on load research samples, the profile shape over the period from time a to b is profiled calculation of site load for daily settlement

$$PLOAD_{stT} = DAYKWH_EST_{stT} * PROFILE_SHAPE_{ptTab}$$

where

$DAYKWH_EST_{stT}$	is an estimate (per Section 2.7) of kWh consumption for site s for the calendar day containing hour t
a	is the first hour of the calendar day containing hour t
b	is the last hour of the calendar day containing hour t
p	is the profile class of site s at hour t as at time T.

(12) Profiled calculation of site load for monthly, interim and final settlement

$$PLOAD_{stT} = \begin{cases} \text{LSA estimate (per Section 2.7); if } M_{stT} \text{ is missing} \\ M_{stT} * PROFILE_SHAPE_{ptTab} \text{ otherwise.} \end{cases}$$

where

M_{stT}	is the consumption amount for site s for the meter-reading period that contains hour t as at time T
a	is the deemed meter reading time on the start date of the time period covered by M_{stT}
b	is the deemed meter reading time on the end date of the time period covered by M_{stT}
p	is the profile class of site s at hour t as at time T.

6.4.3 Site specific load settlement reporting

The following elements must be reported by LSA. Elements (1), (2) and (3) are reported to each retailer for each of its own enrolled sites only.

(1) Daily site load

$$DSLOAD_{sDT} = \sum_{t \in D} SLOAD_{stT}$$

where

$SLOAD_{stT}$	is the site load as defined in Section 6.4.2(7)
s	is a site enrolled by retailer r in hour t
t	is the hour of power flow
D	is the calendar day that site-specific load settlement results are reported for
T	is the as at date of the settlement run.

$$DSLOSS_{sDT} = \sum_{t \in D} L_{stT}(SLOAD_{stT})$$

(2) Daily site loss

where

L_{stT} is the distribution loss function as defined in Section 6.4.2(5)

(3) Daily site UFE

(a) If all sites within a zone receive UFE allocation or all sites within a zone do not receive UFE allocation, the following formula is applicable:

$$DSUFE_{sDT} = \sum_{t \in D} ZUFE_{tT} * (SLOAD_{stT} + L_{stT}(SLOAD_{stT}))/(ZLOAD_{tT} + ZLOSS_{tT})$$

where

$ZUFE_{tT}$ is the zone UFE as defined in Section 6.4.2(3)
$ZLOAD_{tT}$ is the zone load as delivered to sites defined in Section 6.4.2(1)
$ZLOSS_{tT}$ is the zone losses as defined in Section 6.4.2(2).

(b) In all other instances, the following formula is applicable:

$$DSUFE_{sDT} = \sum_{t \in D} SUFE_{stT}$$

where

$SUFE_{stT}$ is the site UFE as defined in Section 6.4.2(6)(b).

6.5 Diagnostics

The load settlement system will provide the diagnostics listed below. The diagnostics will be available to retailers through the settlement summary information transaction (SSI).

6.5.1 Required UFE statistics

For each settlement run (daily, monthly, interim, final) report UFE statistics calculated across all hours *h* in the run

(i) UFEh for each hour *h*

(ii) minh and maxh (UFEh) over hours *h*

(iii) mean (UFEh)

(iv) mean(| UFEh |)

6.5.2 Required zero balance check

For each hour of daily, monthly, interim, or final settlement run, report

(1) *a* = Zone total load (sum of POD loads)

(2) *b* = Sum of retailer-settled loads, excluding loss and UFE

(3) *c* = Sum of loss allocation to retailers

(4) *d* = Sum of UFE allocations to retailers

(5) Hourly zone load reconciliation error (*r*), which should be zero except for rounding error:

$$r = a - (b+c+d)$$

(6) Hourly zone loss as a per cent of zone loads at the customer meter: *c/b*

(7) Hourly zone UFE as a per cent of zone loads at the customer meter: *d/b*

6.5.3 System performance diagnostics

The LSAs will perform the diagnostics listed below at a minimum of one day per month for each applicable settlement run unless otherwise stated below and report them as per Section 11.2.2. As part of any settlement engine audit in accordance with Section 2.14, the LSAs must demonstrate that they have performed these diagnostics as required since the last audit. The ISO will review and investigate results outside of tolerances and shall provide a summary report to the market indicating that this code is being complied with and where the rules are not being followed.

(1) Zone load zero balance check

Confirm that zone results in the SSI balance with POD data, distribution interchange, distributed generation (excluding small micro-generation), isolated community generation and extra-provincial suppliers of border customers for each hour in the DSM of each settlement run (daily, monthly, interim and final).

(a) *a* = Zone POD Load Total (kWh) from SSI transactions

(b) *b* = ZPOD calculated as per Section 6.4.1(1) from DSM transactions

(c) Hourly zone grand total reconciliation difference: $r = a - b$

where r = reconciliation difference.

(2) Zone level retailer zero balance check

Confirm that zone results in the SSI balance with the load allocated to retailers in the wholesale settlement information transaction (WSI). For each hour of each settlement run (daily, monthly, interim and final):

(a) a = Zone settled load, excluding loss and UFE

(b) b = Zone loss allocation

(c) c = Zone UFE allocation

(d) d = Sum of retailer-settled loads, excluding loss and UFE

(e) e = Sum of retailer loss allocation

(f) f = Sum of retailer UFE allocation

(g) Hourly zone load reconciliation difference: $r = a - d$

(h) Hourly zone loss reconciliation difference: $r = b - e$

(i) Hourly zone UFE reconciliation difference: $r = c - f$

(j) Hourly zone grand total reconciliation difference: $r = (a + b + c) - (d + e + f)$

where r = reconciliation difference.

(3) Site-level retailer zero balance check

Confirm that site-level results reported in the WSD balance with the load allocated to retailers reported in the WSI. For each settlement run (daily, monthly, interim and final) site-level statistics calculated for day D (at a minimum one day within the load settlement period must be selected) for each retailer in each zone.

(a) a = Daily retailer total from hourly settled load, excluding loss and UFE

$$\sum_{t \in D} RLOAD_{rtT}$$

where

$RLOAD_{rtT}$ is the retailer r settled load excluding loss and UFE allocations in hour t as at time T defined in Section 6.4.2(4).

(b) b = Total daily retailer loss allocation

$$\sum_{t \in D} RLOSS_{rtT}$$

where

$RLOSS_{rtT}$ is the retailer r total distribution loss in hour t as at time T defined in Section 6.4.2(5).

(c) c = Total daily retailer UFE allocation

$$\sum_{t \in D} RUFE_{rtT}$$

where

$RUFE_{rtT}$, is the retailer r total UFE in hour t as at time T defined in Section 6.4.2(6).

(d) d = Daily retailer total from site-level settled allocation, excluding loss and UFE

$$\sum_{s \in E_{rDT}} DSLOAD_{sDT}$$

where

E_{rDT} is the set of all sites enrolled with retailer r in the zone on day D as at time T

$DSLOAD_{sDT}$ is the daily site settled load for site s for day D as at time T defined in Section 6.4.3(1).

(e) e = Daily retailer total from site-level loss allocation

$$\sum_{s \in E_{rDT}} DSLOSS_{sDT}$$

where

E_{rDT} is the set of all sites enrolled with retailer r in the zone on day D as at time T

$DSLOSS_{sDT}$ is the daily site loss for site s for day D as at time T defined in Section 6.4.3(2).

(f) f = Daily retailer total from site-level UFE allocation

$$\sum_{s \in E_{rDT}} DSUFE_{sDT}$$

where

E_{rDT} is the set of all sites enrolled with retailer r in the zone on day D as at time T

$DSUFE_{sDT}$ is the daily site UFE for site s for day D as at time T defined in Section 6.4.3(3).

(g) Daily retailer load reconciliation difference: r = a – d

(h) Daily retailer loss reconciliation difference: r = b – e

(i) Daily retailer UFE reconciliation difference: r = c – f

(j) Daily retailer grand total reconciliation difference: $r = (a + b + c) - (d + e + f)$

(4) Enrolment switches

For a selected day within the load settlement period, confirm that every enrolment switch results in allocation of energy as reported in the WSD to the correct retailer of record on the day of the switch as per the select retailer notification transaction (SRN). Perform this confirmation for each settlement run (daily, monthly, interim and final).

(5) Cumulative meter reads balancing

Confirm that site-level load settlement results reported in the WSD match the DCM and do not over- or under-allocate the load. This test is subjected to the following restrictions:

(a) Only WSDs generated by settlement runs with frozen profiles are used, i.e. the interim and final settlements.

(b) DCMs for which the load settlement results (WSDs) for the entire meter-reading period are computed using the profiled calculation outlined in Section 6.4.2(12).

(c) The profiled calculation of site load error ($PERROR_{stT}$) for site *s* for the meter-reading period that contains hour *t* as at time *T* is calculated as follows:

$$PERROR_{stT} = M_{stT} - \sum_{t \in [a..b]} PLOAD_{stT}$$

where

M_{stT}, $PLOAD_{stT}$, *a* and *b* are defined in Section 6.4.2(12).

(6) Interval meter reads balancing

Confirm that site-level load settlement results reported in the WSD match the DIM and do not over- or under-allocate the load for at least one day each month for each settlement run (daily, monthly, interim and final).

The interval calculation of site load error ($IERROR_{sDT}$) for site *s* for the meter reading for day *D* (the calendar day that load settlement results are reported for) as at time *T* is calculated as follows:

$$IERROR_{stT} = \sum M_{stT} - DSLOAD_{sDT}$$

where

M_{stT}	is the interval consumption for interval site *s* at hour *t* as at *T*
$DSLOAD_{sDT}$	is the daily site settled load for site *s* for day *D* as at time *T* defined in Section 6.4.3(1).

(7) Percentage of non-estimated result source data

The LSAs will calculate for a given day D within the month of final settlement, the percentage of sites settled and percentage of energy settled not estimated by the settlement engine, i.e. no DIM or DCM available. This percentage is calculated as follows:

(a) a = Number of WSD records generated for the day

(b) b = Number of WSD records with the flag set to "M" in the Result Source field

(c) c = Sum of Daily Site Usage (kWh) for all WSD records generated for the day

(d) d = Sum of Daily Site Usage (kWh) for all WSD records generated for the day with the flag set to "M" in the Result Source field

(e) Percentage of non-estimated WSD records = b / a

(f) Percentage of non-estimated load = d / c

7 Information exchange

7.1 Business transactions

(1) The transaction sets required to support load settlement processes are listed in Table 4. Transactions sets for which standard content or electronic transmittal is required are indicated by checkmarks in the third and fourth columns of the table, respectively. Universal standards for electronic and standard content transactions as well as detailed transaction content are provided in Section 9.

(2) The transaction standards are required for data exchange between separate organizations or companies. However, where separate functions are performed by different parts of a bundled organization, such as MDM and LSA functions within the WSP, adherence to these transmittal standards is not required for transactions between these functional areas. Adherence to the standards is required for transactions between the bundled organization and any external parties.

Table 4. Business process flows and transaction sets required for load settlement

Transaction set	Transaction	Standard content required?	Electronic transmittal required?
Select retailer transaction set			
	A. Select retailer request (SRR)	✓	✓
	B. Select retailer notification (SRN)	✓	✓
	C. Notify old retailer (SRO)	✓	✓
	D. Settlement (LSA) notify wires and MDM (SRW)	✓	✓
Update customer information transaction set			
	A. Update customer information (UCI)	✓	✓
	B. Request update customer information (RUC)	✓	✓
Energize site transaction set			
	A. Energize request (ENR)	✓	✓
	B. Energize failure (ENF)	✓	✓
	C. Energize completion to retailer LSA and MDM (ENC)	✓	✓
De-energize site transaction set			
	A. De-energize request (DER)	✓	✓
	B. De-energize failure (DEF)	✓	✓
	C. De-energize completion to retailer, LSA and MDM (DEC)	✓	✓
Request off-cycle meter read transaction set			
	A. Request off-cycle meter read (ROR)	✓	✓
	B. Request off-cycle meter read completion (ROC)	✓	✓
Revoke de-energize			
	A. Revoke de-energize request (RDR)	✓	
De-select retailer transaction set			
	A. De-select request (DSR)	✓	✓
	B. De-select notification (DSN)	✓	✓
	C. Revoke de-select request (RDS)	✓	✓
	D. Revoke de-select notification (RDN)	✓	✓
Update site information transaction set			
	A. Site metering characteristics (SMC)	✓	✓
Provide consumption data transaction set			
	A. Daily interval meter readings to retailers and LSA (DIM)	✓	✓
	B. Daily cumulative meter consumption to retailer and LSA (DCM)	✓	✓
Provide wholesale load settlement data transaction set			
	A. Wholesale settlement information (WSI)	✓	✓

Transaction set	Transaction	Standard content required?	Electronic transmittal required?
	B. Settlement summary information (SSI)	✓	✓
	C. Settlement profile information (SPI)	✓	✓
	D. Daily system measurement (DSM)	✓	✓
	E. Wholesale settlement summary (WSS)	✓	✓
	F. Detailed settlement information for retailer's own sites (WSD)	✓	✓
	G. Wholesale class information (WCI)	✓	✓
PFAM transactions transaction set			
	A. Retailer specific adjustment (RSA)	✓	✓
	B. Retailer adjustment to market (RAM)	✓	✓
	C. Transmission administrator adjustment (TAA)	✓	✓
Micro-generation transaction set			
	A. Micro-generation interval meter readings to retailers (GIM)	✓	✓
	B. Micro-generation cumulative meter reading to retailers (GCM)	✓	✓
	C. Micro-generation retailer notification (GRN)	✓	✓
	D. Micro-generation retailer summary (GRS)	✓	✓

7.2 Transaction transport method

(1) The Internet is the transport mechanism for electronic data exchange.

(2) Each participant must exchange data securely in files formatted using CSV format.

(3) Appendix B identifies the current transport mechanism used by market participants.

7.3 Electronic transaction content

Section 9 contains the information exchange standards. Detail for electronic and standard content transactions is provided.

(1) Provide consumption data transactions

(a) Meter data are transmitted daily to the LSA from MDM for cumulative read consumption data and interval consumption data.

(b) For cumulative meter reads, the data will be sent when they become available after passing validation, estimation and editing (VEE).

(c) MDMs must routinely provide meter reading data for the current period to retailers for each retailer's sites. Bulk transmittal of files including all sites for the retailer, each identified by site ID, is sufficient to meet this requirement. That is, for current data, MDMs are not required to provide separate data sets for specific requested site IDs.

(2) Provide wholesale settlement data

(a) This transaction set consists of data transmitted to the ISO from the LSA. The WSI transaction is the computed load settlement for each retailer that is sent to the ISO each business day.

(b) Other data computed each business day by the LSA, but not specific to any retailer, will be provided electronically to all retailers. Such data as zone POD load, zone UFE and zone loss percentage are included in SSI and WSI transactions. Likewise, load settlement profile data available to all retailers will be provided electronically as shown in the settlement profile information transaction (SPI).

7.4 Enrolment mechanics

(1) Customers can switch retailers no more than once per day.

(2) Retailer switches occur at midnight. All enrolment requests shall be processed to be effective the midnight following the receipt of a valid enrolment request. For example, if the enrolment request is received at 23:00 on July 21, the enrolment, provided the transaction is valid, will be effective at 00:00 on July 22, one hour later.

(3) Enrolments can occur on any calendar day, regardless of holidays or non-business days. The retailer shall manage the enrolment queue and shall send the enrolment request transactions to the LSA on the calendar day prior to the desired effective date.

(4) The first enrolment request received by an LSA and made effective for a site for a particular day determines the site assignment from that day until the next effective retailer switch except where an enrolment request is from a regulated rate provider or default supplier in response to a de-select request. For example, if two enrolment requests for the same site are received on the same day, one at 1 p.m. from retailer A and one at 2 p.m. from retailer B, retailer A will be assigned the site effective the next day, if the enrolment is not in response to a de-select request. However, if retailer A is a regulated rate provider or default supplier and is requesting enrolment in response to a de-select request transaction for a site, then retailer B will be assigned the site.

(5) The LSA shall process enrolment requests on the day of receipt as follows:

Notification of successful enrolment shall be provided to the new retailer, the WSP and the MDM, and notification of retailer switch shall be provided to the retailer of record on the day preceding the switch in accordance with the following:

(a) Ninety per cent of the enrolment requests received between 7 a.m. and 3 p.m. each day will be responded to within two hours, with the remaining 10 per cent being responded to within four hours. This standard shall be based on the total number of enrolment requests received by each LSA from all retailers on a calendar day basis.

(b) If an enrolment request is received after 3 p.m., it will be processed by the LSA to be effective at midnight, but there is no guarantee that the notifications required by Section 9.6.3 will be sent to the required parties prior to 9 a.m. the following day.

(c) An exception to the performance standard stated in Section 7.4(5)(a) above shall be permitted for scheduled maintenance or for other reasons that are specifically approved by the AUC, not to exceed two non-consecutive calendar days per calendar month.

(6) Erroneous enrolment

An erroneous enrolment arises when one of the following situations occurs prior to enrolment:

(i) site ID and service address are mismatched

(ii) incorrect information is provided by customer, applicant or any other party

(iii) error by the WSP or the retailer or its agent

(a) When a retailer identifies that an erroneous enrolment has occurred, that retailer shall notify the LSA of the error within one business day of the discovery of the error.

(b) When the LSA discovers that a retailer has potentially erroneously enrolled a site, the LSA shall provide notification simultaneously to both retailers affected, including the retailer that has potentially erroneously enrolled a site and the previous retailer, within one business day of the discovery of the potential error. The retailer that has potentially erroneously enrolled a site shall investigate whether the site ID or the service address was erroneously enrolled and respond simultaneously to the LSA and to the other affected retailer within five business days, confirming or denying that the site was erroneously enrolled.

(c) The LSA shall confirm the receipt of the notification given in accordance with Section 7.4(6)(a) above or the confirmation received from the retailer in accordance with Section 7.4(6)(b) above.

(d) The LSA shall contact the previous retailer within one business day from the receipt of the notification (a) or confirmation (b) from the retailer responsible for the erroneous enrolment.

(e) The previous retailer shall re-enrol the site within two business days from the date of notification from the LSA.

(f) Compliance with sections 7.4(6)(a) or (b) above does not preclude the retailer from de-selecting the site at any time during this process.

(7) Grouped site

When a group of sites is enrolled together in the same file with one retailer in accordance with Section 4.5.4(1)(d):

(a) A grouped site is identified by the Cluster Correlation Key (sequence 38 of the SID transaction)

(i) A parent site has its own site ID in the Cluster Correlation Key field; and

(ii) A child site has its parent site ID in the Cluster Correlation Key field.

With the exception of a new site addition to a grouped site, if an enrolment or de-enrolment request is received without an enrolment or de-enrolment request for all sites in a grouped site at the same time within the same file, the LSA will reject an enrolment or de-enrolment request with a transaction status code of 0019 – Incomplete grouped site information (Table A-8).

(8) Abandoned oil and gas well sites

For abandoned oil and gas well sites or lighting sites affiliated with oil and gas sites located on rural land

(a) A retailer must perform a search on the Orphan Well Association's (OWA) Orphan Wells to be Abandoned list to verify whether the company (i.e., Licensee Name) is on the list;

(b) Retailers must use DSR with reason code of "0004" where

(i) there is a trustee for abandoned oil and gas well site; or

(ii) the customer is in receivership or part of the OWA; or

(iii) when bankruptcy occurs to the customer.

(c) A regulated rate provider will enrol the customer (by issuing SRR and UCI) and de-energize the site (by issuing a DER with de-energize reason code "0006" for "Vacant premises").

(d) Billing must be handled in accordance with the WSP's and the regulated rate provider's terms and conditions of service.

7.5 Changes in profiling class

(1) If the LSA changes a customer's profiling class, the LSA must notify the retailer. The LSA will make a best effort to provide the notification in advance of the profile class change. However, the LSA will not attempt to synchronize the notification with enrolment or change of meter, in the case of conversion from cumulative metering (load profiled) to interval metering. The means of notification is up to each LSA and is not a standard transaction in this code.

(2) For changes in profiling class in response to a retailer request, no standard transaction is required either for receiving the request or notifying the retailer of the change.

7.6 Site ID removal from site catalogue

When a site ID is removed from the catalogue, the WSP shall:

(1) Notify the retailer that it is no longer the retailer of record for that site using the notify old retailer transaction (SRO) as per Section 9.6.3.3.

(2) Ensure that the site ID can no longer be enrolled.

(3) Ensure that the site ID will not be reused.

7.7 Remove load limiter and leave power on

When a load limiter is installed at a site and the retailer would like it removed with power fully restored, the process is listed as follows:

(1) The retailer sends an energize request transaction (ENR) to the WSP.

(2) When the WSP receives the ENR from the retailer, the WSP shall attempt to remove the load limiter and restore full power to the site.

(3) The WSP updates its system with load limiter removal details and sends an energize completion to retailers and LSA transaction (ENC) with the date power was restored. A site metering characteristics transaction (SMC) is sent to the retailer with the date and time power was restored and with the Energized Indicator field changed from "L" to "Y."

(4) If the WSP is unable to remove the limiter, an energize failure transaction (ENF) is sent to the retailer with the appropriate transaction status code to explain why the limiter cannot be removed.

7.8 Remove load limiter and disconnect power

When a load limiter is installed at a site and the retailer would like it removed with power fully disconnected, the process is listed as follows:

(1) The retailer sends a de-energize request transaction (DER) with the appropriate de-energize reason code to the WSP.

(2) When the WSP receives the DER from the retailer, the WSP shall attempt to remove the load limiter and disconnect power at the site.

(3) The WSP updates its system with the load limiter removal and disconnection details and sends a de-energize completion to retailers and LSA transaction (DEC) with the date power was disconnected. An SMC is sent to the retailer with the date and time power was disconnected and with the Energized Indicator field changed from "L" to "N."

(4) If the WSP is unable to remove the limiter, a de-energize failure transaction (DEF) is sent to the retailer with the appropriate transaction status code to explain why the limiter cannot be removed.

7.9 Install load limiter

A retailer cannot request the installation of a load limiter. In a situation where the retailer requests the de-energization of a site, the WSP may choose to install a load limiter due to seasonal, safety or other reasons.

(1) The retailer sends a DER with an appropriate de-energize reason code to the WSP.

(2) When the WSP receives the DER from the retailer-to disconnect power to the site, the WSP may install a load limiter because of seasonal, safety or other reasons.

(3) The WSP updates its system with the load limiter installed details and sends a DEF with reason code "1224" (limiter installed) in the De-energize Failure Reason Code field to the retailer. An SMC is sent to the retailer with the Energized Indicator field changed from "Y" to "L."

7.10 Streetlights

7.10.1 Streetlight grouping process

(1) The WSP must collaborate with the legal entity financially responsible for the energy consumption for a given streetlight (streetlight customer) to determine which streetlights will be included as part of a grouped streetlight. Retailers may also be included in the streetlight grouping discussions if requested by the streetlight customer.

(2) Once the WSP and streetlight customer have agreed upon the streetlights to be grouped, the WSP must create one or more grouped streetlights. The WSP may only create as many grouped streetlights as are required to ensure each grouped streetlight complies with Section 7.10.1(3).

(3) Streetlights assigned to a grouped streetlight must:

(a) Be assigned the same tariff rate code, profile type, profile class and loss group code.

(b) Belong to the same settlement zone and franchise area.

(c) Belong to the same streetlight customer.

(4) When changes to a grouped streetlight are required at the request of the streetlight customer, the WSP must add or remove streetlights from or to the grouped streetlight in accordance with Section 7.10.1(3) above. The WSP may notify the retailer of record and/or the streetlight customer following any changes to a grouped streetlight.

(5) In the event a streetlight customer is no longer financially responsible for a portion of the streetlights assigned to a grouped streetlight, the grouped streetlight must be modified accordingly through consultation with both the old and the new streetlight customer.

7.10.2 Streetlight information exchange

(1) Once the grouped streetlight has been created, the WSP must follow the rules set out in Section 9.4.6.14 to have the grouped streetlight reflected in the site ID catalogue.

(2) A retailer, following a request from the streetlight customer to enrol a grouped streetlight, must follow the process rules set out in Section 9.6.3 to request an enrolment of the grouped streetlight with the LSA.

(3) Section 2.6 of the code does not apply to a grouped streetlight. Instead the following applies to grouped streetlights:

(a) The energized status of a grouped streetlight, as specified in the SMC transaction, is not indicative of the physical energized state of the lights assigned to that grouped streetlight.

(b) Where a WSP has provided an SMC transaction to the retailer of record, following successful enrolment of a grouped streetlight, and that SMC indicates the grouped streetlight is not energized, the retailer of record must send an ENR transaction to the WSP within one business day to start the settlement process for the grouped streetlight.

(c) A DER transaction is not required to be sent by the retailer of record when a grouped streetlight site ID is to be removed from the site catalogue.

(4) Energy consumption and demand, where applicable, for a grouped streetlight must be provided by the MDM to the LSA and retailer of record via DCM transactions. They must represent consolidated information, all in accordance with Section 9.6.1.3 where applicable (e.g. the meter number field will not be populated nor will other fields applicable only to metered sites).

(5) A WSP must provide additional information regarding and in support of a grouped streetlight to the retailer of record and/or the streetlight customer responsible for that grouped streetlight following an inquiry from either party.

(6) All other information exchange standards set out in this code that apply to a site ID also apply to a grouped streetlight.

7.11 Micro-generation grouped site process

(1) The WSP must collaborate with the micro-generator to determine which sites will be included as part of a grouped site.

(2) Once the WSP and micro-generator have agreed upon the sites to be grouped, the WSP must identify the grouped site in the site ID catalogue transaction as described in the Cluster Correlation Key field (Sequence 38) and the Micro-generator Indicator field (Sequence 41).

(3) When changes to a micro-generation grouped site are required at the request of the micro-generator, the WSP must remove sites from or add to the grouped site in the site ID catalogue in accordance with Section 7.11(2) above.

(4) The WSP must notify the retailer of record and the micro-generator following any changes to a grouped site by email, or other previously agreed upon method.

(5) The WSP must update the Cluster Correlation Key field (Sequence 38) of the site ID catalogue.

8 Standards for load profiles based on load research samples

8.1 Introduction

Class load profiles based on load research samples must meet the standards defined in this schedule. Standards are specified in three general areas:

(a) estimation accuracy

(b) frame adequacy

(c) sample design and implementation

The standards for each of these areas are described below.

8.2 Estimation accuracy

Estimation accuracy refers to how well the load research sample and estimation procedure estimate the quantity of interest.

8.2.1 Test parameter

(1) The accuracy of an estimated class load profile will be measured in terms of the accuracy of the load-weighted average price per kWh U_c. This test parameter is defined as:

$$U_c = \sum_h L_h U_h \Big/ \sum_h L_{ch}$$

where

U_c	=	load-weighted average price per kWh for class *c*
L_{ch}	=	class *c* load at hour *h*
U_h	=	wholesale market commodity price of electricity at hour *h*.

The summation is over a full year.

(2) The profiling accuracy standard addresses how well the class average is estimated.

8.2.2 Measuring estimation accuracy

The estimation accuracy is defined in terms of the variance V_c of the estimate of the class unit price U_c. This mean squared error consists of sampling error and modelling error. That is,

$$V_c = V_{cs} + V_{cm}$$

where

V_{cs}	=	sampling variance for class *c*
V_{cm}	=	modelling variance for class *c*.

(1) Sampling variance

(a) The sampling variance V_{cs} is determined by applying appropriate statistical methods to the statistical sample. Specifically, for each site j in the sample, determine the site's load-weighted average annual price U_j analogously to the determination of the class average price U_c:

$$U_{sj} = \sum_h L_{sjh} u_h / \sum_h L_{sjh}$$

where

U_{sj}	=	load-weighted average price per kWh for site *j*
L_{sjh}	=	site *j* metered load at hour *h*
u_h	=	wholesale market commodity price of electricity at hour *h*.

The summation is over a full year.

(b) The class mean price $\overline{U_c}$ is calculated as the energy-weighted average of the site-specific average prices U_{sj}:

$$\overline{U_c} = \frac{\sum_{j=1}^{n} w_j (\sum_h L_{sjh}) U_{sj}}{\sum_{j=1}^{n} w_j (\sum_h L_{sjh})}$$

where

n	=	number of sites in the sample for class *c*
w_j	=	expansion weight for site *j*.

(c) The sampling variance V_{cs} of the class unit price is then calculated as the variance of the ratio estimator $\overline{U_c}$, using standard statistical formulas appropriate to the sample design.

(d) In the simplest case, none of the sampled sites j have any missing data, and the expansion weights used to calculate the class load L_{ch} from the site loads L_{sjh} are constant over all hours of the year. In this case, the mean class price $\overline{U_c}$ obtained by combining the site-specific prices U_{sj} will coincide with the class price U_c calculated by applying the hourly prices u_h to the estimated class loads L_{ch}. In this case, the variance V_{cs} calculated as indicated is a direct estimate of the sampling variance of the class average price U_c.

(e) If there are some missing data and/or the expansion weights vary over the year, the mean class average price $\overline{U_c}$ may differ from the direct calculation U_c. In this case, the variance V_{cs} calculated as indicated is a good approximation to the sampling variance of the class average price U_c.

(2) Dynamic estimation

If dynamic estimation is used, the sampling variance is the only estimation variance. That is, with dynamic estimation,

$$V_c = V_{cs}$$

(3) Estimates based on historical data

If an estimate for the day of interest is constructed from historical data, the estimation variance is the sum of the sampling variance V_{cs} that would apply with dynamic estimation, plus the modelling variance V_{cm}. The word "modelling" as used here includes any procedure that constructs estimates for the current day from historical data. Such procedures include regression modelling, as well as proxy-day or static methods.

The modelling variance is calculated as follows:

(a) A minimum of three years (36 months) of historical data is required. (This requirement appears also in Section 8.3.2)

(b) For each year of historical data, treat that year as the year for which profiles are to be estimated, and construct estimates for that year using the remaining years of data as the historical years and not using any data from that year. For example, if three years of historical data are to be used, estimate

(i) Year 1 using years 2 and 3 as the historical data and no data from Year 1

(ii) Year 2 using years 3 and 1 as the historical data and no data from Year 2

(iii) Year 3 using years 1 and 2 as the historical data and no data from Year 3

(c) Calculate the average unit price for each year of historical data, using the actual load data and also using the estimate developed in step (b) above. The hourly price series u_h to use is defined below. Denote by U_y the average annual unit price calculated for year y from the historical data for year y, and by $\tilde{U_y}$ the average annual unit price calculated for year y using the estimated profile developed in step (b) from the other years of data.

(d) Calculate the modelling variance as

$$V_{cm} = (1/n)\sum_{y}(U_y - \tilde{U_y})^2$$

where

n is the number of years of historical data.

(e) The total variance is given by

$$V = V_{cs} + V_{cm}.$$

(4) Price series

(a) For each year of load data used in the analysis, the wholesale commodity price data will be adjusted to a recent base year. The base year will be the most recent calendar year for which analysis is practical.

(b) For all years of load data used in the analysis, the wholesale price data from that year will be adjusted to the base year conditions so that the mean and standard deviation of log price from the adjusted series will coincide with those from the base year. That is, the adjusted price u'_h at hour h of the year will be calculated as

$$\log(u'_h) = \overline{\log(u^*)} + (s^*/s)(\log(u_h) - \overline{\log(u)})$$

where

s and $\overline{\log(u)}$, respectively, are the standard deviation and mean of log price for the year of the load data, and the corresponding values with asterisks are for the base year.

In calculating the modelling variance V_{cm} as described above, the adjusted price series will be fixed and will not be recalculated as different years of load data are included in the analysis at step (b) above.

For years of load data prior to 1996 (the first year for which Alberta wholesale price data exist), the base year price data will be transferred to the corresponding year of load data. The transfer will map price series data to approximately the same date in the load data year. The price series calendar will be shifted as necessary so that days of the week and holidays will correspond in the price and load series.

8.2.3 Required accuracy level

(1) Measuring accuracy

(a) The estimation accuracy will be measured in terms of the relative standard error of the estimate, also called the coefficient of variation. The standard error S_c of the estimate $\widehat{U_c}$ is calculated as

$$S_c = \sqrt{V_c}.$$

(b) The relative standard error RSE or coefficient of variation CV is calculated as

$$RSE_c = S_c / \widehat{U_c}$$

(c) This calculation applies whether the variance V_c consists only of sampling variance V_{cs}, in the case of dynamic estimation, or also includes modelling variance V_{cm}.

(2) Sampling accuracy requirement

(a) Whether dynamic estimation or some form of modelling is used, the sample must be designed to provide a relative standard error due to sampling of 0.8 per cent or less. That is, the design sampling variance V_{cs} must be such that

$$RSE_{cs} = \sqrt{V_{cs}} / U_c < 0.008$$

(b) The design sampling variance is the projected sampling variance calculated during the design phase prior to collection of load data. The design variance should be based on existing load research samples, if available, and on reasonable assumptions. For load research samples designed prior to this standard or for purposes other than load profiling, compliance with this standard will be based on the achieved variance V_{cs}.

(3) Modelling accuracy requirement

If estimates are based on historical data, the modelling variance V_{cm} must satisfy the criterion

$$RSE_{cm} = \sqrt{V_{cm}} / U_c < 0.008$$

8.3 Frame adequacy

Frame adequacy refers to how well the list of customers from which the sample was drawn matches the target population—that is, the list of customers to whom the profile will be applied.

8.3.1 Maximum allowable difference between the sampling frame and target population

(1) Sites in the sample frame who are not in the target population

Sites selected for the sample that fall out of the target population over time must be dropped from the sample used to estimate the population. In this way, the sample will represent only sites that continue to be in the target population. Sites may fall out of the target population because they shut down entirely, because they move to another profiling class or because they install interval meters and leave profiling status altogether. In and of itself, a change in occupant at a site does not constitute leaving the population, though a change of occupant may be the reason for a change in site status.

(2) Sites in the target population who are not in the sample frame

Sites may be in the population but not in the frame if the site came into existence after the sample was drawn, or if the site changed from one profiling class to another. The sample design must be updated when the collection of sites that is in the target population but not in the sample frame constitute more than 20 per cent of the annual energy of the target population. Updating the sample design does not necessarily require redrawing the entire sample. Updating could simply mean adding another stratum to represent newcomers.

(3) Adjustments for divergence between the frame and population

The sample must be post-stratified to represent the current target population. That is, the expansion weights must be based on current stratum-level population counts. If ratio estimation is used, the expansion weights must be based on current stratum-level ancillary variable totals.

8.3.2 Minimum number of years of historical data

If historical load research data are used for estimating class profiles, a minimum of three full years (36 months) of data are required. This requirement applies only if historical data are used for profile estimation, not if dynamic estimation is used.

8.3.3 Maximum age of historical data

The maximum age of historical data that may be used for estimation is 10 years.

8.4 Sample design and implementation

8.4.1 Sample design and analysis principles

(1) Any statistical sample design may be allowed, provided that it is based on random sampling from well-defined and identifiable sampling cells.

(2) Sampling within cells may be by simple random sampling, or by more complex methods, provided the procedures are well-defined and provide a basis for calculating appropriate expansion weights and variances.

(3) Random sampling may be implemented by systematic sampling from a randomized list.

(4) Some sampling strata may be designated as certainty strata. That is, all customers within this stratum are selected with certainty and represent themselves only.

(5) The estimation and variance calculation procedures applied must be appropriate to the sample design.

8.4.2 Sample implementation principles

The above principles refer to how the customers are theoretically selected. In practice, customers actually included in a sample are often only a subset of those initially targeted. The difference is the result of refusals, difficulty with meter installation and finding that selected customers no longer exist. Following are standards for implementing the sample design:

(1) The best reasonable effort will be made to avoid notifying customers selected for the sample of this selection.

(2) Sites should not be excluded from the sample because they turn out to be remote or complex to meter. However, sites that are more expensive to meter may be put into a different sampling stratum and sampled at a lower rate.

(3) The maximum fraction of sites that are selected for the sample, but at which load research meters are not installed, should be less than 10 per cent of the total number selected for the sample. This maximum non-installation rate includes customer refusals, failure to install for logistical reasons and customers dropping out.

(4) At each hour for which the class load is estimated from the sample, data may be missing for no more than 25 per cent of the installed and active sites for the class.

9 Information exchange standards

9.1 Purpose

(1) The purpose of Section 9 is to define the electronic and non-electronic information exchange standards for the business transactions. In addition to defining the format and contents of each transaction, universal standards that govern all transactions are specified.

(2) The standards are intended to be as specific as practical to facilitate data exchange among market players. At the same time, it may turn out in the course of system implementation that certain details require adjustment for practical reasons. These specifications may be revised if the need for such adjustment becomes clear.

9.2 Scope

The scope of this documentation is limited to the electronic and standard content transactions in Table 4 of Section 7.

9.3 Revisions

Revisions to these information exchange standards, including both additions and changes, may be made by the Commission in consultation with stakeholders.

9.4 Universal standards

9.4.1 Directory structure

The directory structure for the electronic files is dependent upon the transaction transport method.

9.4.2 File naming convention

(1) All transactions of the same type for a period (usually one day) are to be placed in a single CSV format file. The standard file naming convention is:

TRX_From_To_YYYYMMDDHHMISS.CSV or
TRX_From_To_YYYYMMDDHHMISS.csv

where,

TRX	Three-letter abbreviation for the transaction name (e.g. “SRR”). The three letters must be in upper case format.
From	ID of the sender (e.g. WSP ID, retailer ID, LSA ID, MDM ID)
To	ID of the receiver (e.g. WSP ID, retailer ID, LSA ID, MDM ID, ISO ID)
YYYYMMDD	Date the file was created
HHMISS	Time the file was created on a 24-hour clock.

(2) In the case where the file has no single recipient such as in SSI and SPI transactions, the “To_” may be omitted from the file name. The file name would be as follows:

TRX_From_YYYYMMDDHHMISS.CSV or
TRX_From_YYYYMMDDHHMISS.csv

(3) For transactions with the Transaction Status Code field populated, a rejected file may be returned to the original sender to notify the sender of any errors in individual transactions. The rejected file would be returned using the file name under which it was received, with an "R" appended at the end of the file name before the .CSV or .csv.

9.4.3 Universal transaction contents

All transactions are to include the following fields or elements:

(1) Transaction abbreviation (three-character abbreviation that must be in upper case letters).

(2) Identification of the sender (retailer ID, WSP ID, LSA ID or MDM ID).

(3) Identification of the recipient (retailer ID, WSP ID, LSA ID or ISO ID).

(4) Transaction date and time (the Transaction Date Time field in all transactions is the later of the time the transaction was created or last modified).

9.4.4 Field description definitions

The fields specified in Section 9.6 use the following definitions:

(1) Mandatory: Must be populated in the transaction and the data must be valid.

(2) Conditional: Populated according to stated production rules or specified in applicable transaction field descriptions.

(3) Optional: Populated at sender's discretion.

9.4.5 Data-type definition

9.4.5.1 Char(x)

Fixed length character always x characters in length.

"ABC" is an example of Char(3).

9.4.5.2 Varchar(x)

x designates the maximum number of characters.

"A" and "ABC" are both examples of Varchar(3).

9.4.5.3 Number(p,s)

Number with p digits of precision and s digits to the right of the decimal (scale).

"123456.78" is an example of Number(8,2).

9.4.6 Standard fields

This section contains common fields that may appear in many transactions. For consistency and to avoid confusion within the transactions, refer to these fields using their full name at all times (e.g., Settlement ID and not Sett. ID).

9.4.6.1 Date and date time format

The standard date time format has been defined as:
YYYYMMDDHHMISS

where,

YYYY	four-digit year (e.g. 2020)
MM	two-digit numeric month between 01 and 12 inclusive (e.g. 09)
DD	two-digit numeric day 01 and 31 inclusive (e.g. 03)
HH	hour on a 24-hour clock 00 to 23 (e.g. 22)
MI	minutes 00 to 59 (e.g. 02)
SS	seconds 00 to 59 (e.g. 09)

For example, 19990903220209 is September 3, 2020, at nine seconds after 10:02 p.m.

The standard date format has been defined as:

YYYYMMDD

where,

YYYY	four-digit year (e.g. 2020)
MM	two-digit numeric month between 01 and 12 inclusive (e.g. 09)
DD	two-digit numeric day 01 and 31 inclusive (e.g. 03)

For example, 20200903 is September 3, 2020.

9.4.6.2 Telephone number format

The standard telephone format used for telephone numbers in Canada and the United States has been defined as:

AAANNNNNNNXXXX

where,

AAA	area code used in Canada and the United States
NNNNNNN	telephone number
XXXX	extension (if any)

9.4.6.3 Time conventions

(1) Alberta~~Clock~~ time

~~Times refer to times on the prevailing local clock, standard or daylight time depending on the season.~~Effective November 1, 2026, all measurements, meter reads, metering data, profiling, transaction records, reports, related settlement calculations, and other market activities occurring on or after that date shall use Alberta time as the applicable time convention.

(2) ~~Adjusting for daylight saving~~Historical time standard

For periods of energy flow occurring before November 1, 2026, all measurements, meter reads, metering data, profiling, transaction records, reports, settlement calculations, and other market activities shall use the historical time standard as the applicable time convention.

Adjusting for daylight saving in DSMs under the historical time standard is explained in Table 13 in Section 9.6.2.4.1. In DIMs, clock adjustments for daylight saving are carried

out using the convention that the clock is set to the new time system at the instant prior to 02:00:00 and 02:00:00 on the old time system never occurs. In the spring, the clock changes from 01:59:59 Mountain Standard Time (MST) to 03:00:00 Mountain Daylight Time (MDT). In the fall, the clock changes from 01:59:59 MDT to 01:00:00 MST. For purposes of identification and reporting of hour ending:

(a) On the day of the springtime change, hour ending 02 does not exist. Hour ending 03 follows hour ending 01. All energy consumed in the period between 00:00:01 and 01:00:00 is labelled "01"; energy consumed in the following hour is labelled "03"; and each hour thereafter is labelled incrementally such that there are 23 identifiers for the day where hour ending 24 is the last hour and hour ending 02 is not used.

(b) On the day of the fall time change, hour ending 02 occurs twice, with the second occurrence denoted with an asterisk (02*). All energy consumed in the period between 00:00:01 and 01:00:00 is labelled "01"; energy consumed in the period between 01:00:01 and 02:00:00 is labelled "02"; energy consumed in the following hour is labelled "02*"; energy consumed in the fourth hour of that day is labelled "03"; and so on, resulting in 25 identifiers for the day where hour ending 24 is the last hour and hour ending 02* is added. The following example is for the purposes of clarification:

Example: Daylight saving change (This example applies to the historical time standard)

Steady state – daylight time			
Actual in UTC*	**Prevailing Time Period**	**HE Identifier**	**Partial DIM Example**[1]
06:00:01 to 07:00:00	00:00:01 to 01:00:00	01	…,20060802010000,15,01,…
07:00:01 to 08:00:00	01:00:01 to 02:00:00	02	…,20060802020000,15,02,…
08:00:01 to 09:00:00	02:00:01 to 03:00:00	03	…,20060802030000,15,03,…
09:00:01 to 10:00:00	03:00:01 to 04:00:00	04	…,20060802040000,15,04,…
Steady State – Standard Time			
Actual in UTC*	**Prevailing Time Period**	**HE Identifier**	**Partial DIM Example**
07:00:01 to 08:00:00	00:00:01 to 01:00:00	01	…,20060202010000,15,01,…
08:00:01 to 09:00:00	01:00:01 to 02:00:00	02	…,20060202020000,15,02,…
09:00:01 to 10:00:00	02:00:01 to 03:00:00	03	…,20060202030000,15,03,…
10:00:01 to 11:00:00	03:00:01 to 04:00:00	04	…,20060202040000,15,04,…
Fall change- MDT to MST			
Actual in UTC*	**Prevailing Time Period**	**HE Identifier**	**Partial DIM Example**[2]
06:00:01 to 07:00:00	00:00:01 MDT to 01:00:00 MDT	01	…,20061029010000,15,01,…
07:00:01 to 08:00:00	01:00:01 MDT to 01:00:00 MST	02	…,20061029010000,15,02,…
08:00:01 to 09:00:00	01:00:01 MST to 02:00:00 MST	02*	…,20061029020000,15,02*,…
09:00:01 to 10:00:00	02:00:01 MST to 03:00:00 MST	03	…,20061029030000,15,03,…
10:00:01 to 11:00:00	03:00:01 MST to 04:00:00 MST	04	…,20061029040000,15,04,…
Spring Change – MDT to MST			
Actual in UTC*	**Prevailing Time Period**	**HE Identifier**	**Partial DIM Example**[3]
07:00:01 to 08:00:00	00:00:01 MST to 01:00:00 MST	01	…,20070311010000,15,01,…
08:00:01 to 09:00:00	01:00:01 MST to 03:00:00 MDT	03	…,20070311030000,15,03,…
09:00:01 to 10:00:00	03:00:01 MDT to 04:00:00 MDT	04	…,20070311040000,15,04,…

* Actual in UTC: This column is provided for clarification purposes.

[1] Examples use a partial excerpt from a DIM file, showing only the last 15-minute record in the hour.
[2] Example is for the daylight time change on October 29, 2006.
[3] Example is for the daylight time change on March 11, 2007.

9.4.6.4 ID assignments

The ISO oversees ongoing ID assignment.

A unique ID will be set up for each business function within the WSP. The WSP will have a three-digit number ID prefixed with a "0"; the LSA will have a three-digit number ID prefixed with a "1" and the MDM will have a three-digit number ID prefixed with a "2."

9.4.6.5 Retailer and business function IDs

(1) Retailer ID

The retailer ID is a nine-digit number that uniquely represents each retailer operating within Alberta (for example, 123456789). The ISO shall assign this number when a participant is approved for pool participant status.

(2) Business function ID

Business function ID codes and processing rules must be interoperable. Business rules may vary from participant to participant. While failures may result from business rule violations, transactions should not fail due to implementation logic. If the Business Function ID field is not used by the LSA, it may be ignored, but a file may not be rejected for this reason. The business function ID codes are shown in Appendix A. Refer to the specific transactions in sections 9.6 and 9.7 to determine what the requirements are and when the business function IDs are to be used.

9.4.6.6 Wire services provider (WSP) ID

(1) A four-digit number uniquely represents each WSP operating within Alberta.

(2) The WSP ID is required to inform market participant who is responsible for the service of the physical site.

Refer to the WSP ID table in Appendix A.

9.4.6.7 Load settlement agent (LSA) ID

(1) A four-digit number uniquely represents each LSA operating within Alberta.

(2) The LSA ID is required in transactions as a verification check for the LSA. The LSA will only process files where the LSA ID is equal to their own.

Refer to the LSA ID table in Appendix A.

9.4.6.8 Meter data manager (MDM) ID

(1) A four-digit number uniquely represents each MDM company operating within Alberta.

(2) The MDM ID is required on transactions to inform the receiver of the data, the party responsible for reading the meter. This becomes important in zones that have multiple MDMs or in the case where an LSA is settling multiple zones.

Refer to the MDM ID table in Appendix A.

9.4.6.9 ISO ID for financial settlement purposes

The ISO ID for financial settlement purposes is "3000."

9.4.6.10 ISO ID for operational purposes

The ISO ID for operational purposes is "4000."

9.4.6.11 Settlement zone ID

A four-digit number that uniquely represents each settlement zone operating within Alberta. The ID is assigned by the LSA. Refer to the settlement Zone ID table in Appendix A.

9.4.6.12 Site ID

(1) A site ID possesses the following characteristics:

(a) A site ID can be enrolled by a retailer.

(b) Consumption is allocated at the site ID.

(c) Load settlement occurs at the level of site ID.

(2) A check digit is required to minimize the possibility of entering an incorrect site ID (e.g., transposition errors on the part of the retailer). This check digit is a calculated number placed into the site ID.

(3) In the event the WSP for a site changes, the first four digits of the site ID must be changed to reflect the new WSP ID. In this situation, the WSP also has the option of changing the entire site ID.

(4) Site ID format:

WSPID99999999Chk

where,

WSP ID	WSP ID (e.g. 0010)
99999999	Eight numbers identifying a site, each WSP can administer as they see fit.
Chk	Single check digit formed by dividing the total of the prior numbers by nine and determining the remainder. The remainder is used as the check digit, having a value between zero and eight.

(5) Check digit calculation example

Sum the following numbers:

Digit 1 (left to right) of the site ID x 1
Digit 2 (left to right) of the site ID x 2
Digit 3 (left to right) of the site ID x 3
. . .
Digit 12 (left to right) of the site ID x 12

Using a sample of 001085434216

The check digit is:

0	1x0
0	2x0
3	3x1
0	4x0
40	5x8

30 6x5
28 7x4
24 8x3
36 9x4
20 10x2
11 11x1
72 12x6

264

264 / 9 remainder 3

Check digit = 3

Full number is 0010854342163.

9.4.6.13 Socket ID

A socket ID is the number assigned to a socket. No site that is cumulative metered may have more than one socket ID associated with it.

99999999

where,

99999999 Eight numbers identifying a socket, each WSP can administer as they see fit.

9.4.6.14 Site ID catalogue transaction (SID) – information requirements

(1) The SID is an electronic file in CSV format. No commas are permitted within a field.

(2) Abbreviations used in addresses must follow the Canada Post Addressing Guidelines.

(3) The SID file is to be updated for accuracy each business day before 9:00 a.m.

(4) Transport/delivery is at the discretion of each WSP.

(5) A WSP must provide the information in a mandatory field in Table 5. In addition, a WSP must provide the information in a conditional field in Table 5, if it has the information required in the conditional field in its records. A WSP may provide the information in an optional field, but is not required to do so.

(6) A WSP must provide a site ID and location information for all sites to which it provides delivery services, in the SID file format. A WSP must respond to requests for site IDs that are not in the site ID catalogue by the end of the next business day.

(7) A WSP must provide all available information to identify the location of a site, including the civic address, the rural address, the legal land description, or any other site identification information. At a minimum, the civic or rural address must be provided if it exists. A civic or rural address must follow the Canada Post Addressing Guidelines. For example, if an apartment number exists as a part of the civic address, it must be provided. In cases where no civic or rural address exists for a site, but subsequently a site is assigned a civic or rural address by the applicable municipal authority, a WSP must update the service address fields accordingly.

Table 5. Site ID catalogue transaction (SID)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SID"	**Mandatory field** – Abbreviation for the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or modified.
3	MDM ID	MDM ID format	**Mandatory field** – MDM for the site. See Appendix A, Table A-5.
4	WSP ID	WSP ID format	**Mandatory field** – WSP for the site. See Appendix A, Table A-3.
5	LSA ID	LSA ID format	**Mandatory field** – LSA for the site. See Appendix A, Table A-4.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Municipality	Varchar(100)	**Mandatory field** – Name of the municipal entity to which Local Access Fees apply for the site. Should match published legal listing from Alberta Municipal Affairs.
8	Unit Designator	Varchar(15)	**Conditional field** – Required if it exists in the distributor's service address. Used to define individual units where no unit number exists (e.g., "Back" or "Basement").
9	Unit Number	Varchar(6)	**Conditional field** – Required if it exists in the distributor's service address. Apartment number, etc.
10	House Number	Varchar(6)	**Conditional field** – Required if it exists in the distributor's service address.
11	Street Pre-Direction	Varchar(2)	**Conditional field** – Required if it exists in the distributor's service address. Standard direction codes (N, W, SW, etc.) which appear in front of the street name (e.g., "W Georgia ST").
12	Street Name	Varchar(50)	**Conditional field** – Required if it exists in the distributor's service address. If the street name is a number, include the digit, not the spelled out name.
13	Street Type Code	Varchar(8)	**Conditional field** – Required if it exists in the distributor's service address. Valid Canada Post codes only.
14	Street Direction	Varchar(2)	**Conditional field** – Required if it exists in the distributor's service address. Standard direction codes (N, W, SW, etc.) which appear after the street name (e.g., "Millwoods RD W").
15	City Quadrant	Varchar(2)	**Conditional field** – Required if it exists in the distributor's service address. Standard direction codes (N, W, SW, etc.) which designate a quadrant in the city.
16	City/Town Name	Varchar(50)	**Conditional field** – Required if it exists in the distributor's service address. Usual name of the city, town, village, summer village, hamlet, etc.
17	Province	Char(2)	**Conditional field –** Required if it exists in the distributor's service address for sites not in Alberta.
18	Legal Subdivision Code (LSD)	Varchar(2)	**Conditional field** – Required if it exists in the distributor's service address. Sections are divided into four quarters or into 16 legal subdivisions. They are numbered 1 to 16.
19	LSD Quadrant	Varchar(1)	**Conditional field** – Required if it exists in the distributor's service address. LSDs are divided into four quadrants: A, B, C and D.
20	Quarter Section Code	Varchar(2)	**Conditional field** – Required if it exists in the distributor's service address. Quarters divide each section into four pieces: NE, NW, SE, SW. This field may optionally be used for: "RL" – River lot
21	Section	Number(2)	**Conditional field** – Required if it exists in the distributor's service address. Sections are divided into four quarters or into 16 legal subdivisions. They are numbered 1 to 36.
22	Township	Number(3)	**Conditional field** – Required if it exists in the distributor's service address. Townships are numbered from south to north starting at the U.S. border. They are numbered 1 to 129 and 141. Each township is six miles (~10 kilometres) wide.
23	Range	Number(2)	**Conditional field** – Required if it exists in the distributor's service address. Ranges are numbered from east to west starting from each meridian. They are numbered 1 to 34. Each range is six miles (~10 kilometres) wide.
24	Meridian	Varchar(1)	**Conditional field** – Required if it exists in the distributor's service address. A meridian defines a block of land between an east and west boundary. For Alberta, the meridians are 4,5 or 6, with 4 being the Saskatchewan border, 5 running just east of the Calgary International Airport and 6 being just east of Jasper. The "W" is implied.

Sequence	Field	Data type/size	Description
25	Rural House Number	Varchar (8)	**Conditional field** – Required if it exists in the distributor's service address. A house number. This is sometimes used in First Nations Reserves to identify unique residences within the rural scheme.
26	Legal Lot	Varchar(6)	**Conditional field** – Required if it exists in the distributor's service address. Defines a lot within a city block.
27	Lot Range ID	Varchar(5)	**Conditional field** – Required if it exists in the distributor's service address.
28	Block	Varchar(5)	**Conditional field** – Required if it exists in the distributor's service address. Defines a city block within a plan.
29	Government Plan ID	Varchar(8)	**Conditional field** – Required if it exists in the distributor's service address. For urban areas, a registered plan defines an area within a city, usually a community.
30	Latitude Coordinates	Number(8,6)	**Optional field** – Populated if the distributor has this information. Coordinates for the location of the site. E.g., Latitude Number (8,6) format 99.999999 E.g., Civic address: 600 3rd Ave S.W., Calgary Latitude: 51.051073
31	Longitude Coordinates	Number(10,6)	**Optional field** – Populated if the distributor has this information Coordinates for the location of the site. E.g., Longitude Number (10,6) format -999.999999 E.g., Civic address: 600 3rd Ave S.W., Calgary Longitude: -114.073840
32	Address Lot ID	Varchar(10)	**Conditional field** – Required if it exists in the distributor's service address. A lot number to identify a lot within a rural addressing scheme. Example: (54 is the Lot ID) "54 26540 Range RD 11 Red Deer County AB T4E 1A3"
33	Address Pre-Road Number	Varchar(10)	**Conditional field** – Must be populated if it exists in the distributor's service address. Number that appears before the road type in the Canada Post Addressing Guidelines (e.g., "26540" in the above example is the pre-road number).
34	Address Road Type	Varchar(20)	**Conditional field** – Must be populated if it exists in the distributor's service address. Road type in the Canada Post Addressing Guidelines e.g., Township Road = "TWP RD", Highway = "HWY", Range Road = "Range RD" ("Range RD" in the above example is the road type).
35	Address Post Road Number	Varchar(10)	**Conditional field** – Must be populated if it exists in the distributor's service address. Number of the road that appears after the road type in the Canada Post Addressing Guidelines ("11" in the above example is the road number).
36	Area Name	Varchar(30)	**Optional field** - Populated at sender's discretion. Oilfield name, subdivision name, etc.
37	REA Name	Varchar(30)	**Conditional field** – Populated if it is an REA site operated by the WSP.
38	Cluster Correlation Key	Number(13)	**Conditional field** - Required if the site is part of a micro-generation grouped site. Identifies a grouping of sites which are normally handled jointly with regards to enrolment.
39	Unformatted Address	Varchar(65)	**Optional field** - Populated at sender's discretion. Address information that does not fit Canada Post Addressing Guidelines.
40	Site Reference	Varchar(50)	**Optional field** - Populated at sender's discretion. Supporting helpful information.
41	Micro-generator Indicator	Char(1)	**Mandatory field** – "Y" - Micro-generator is commissioned. In the case of a grouped site, this would be the parent site ID and this same site ID would be included in the Cluster Correlation Key field (Sequence 38). "N" - Micro-generator is decommissioned, does not exist, or is a child site of a group. In the case that it is a child site, the parent site ID is included in the Cluster Correlation Key field (Sequence 38).
42	Virtual Site Indicator	Char(1)	**Conditional field** – 'Y' in the case of a virtual grouped site with no physical service address. E.g., When a single site ID is used to represent multiple services such as: street lights, rail road crossings, transit bus shelters, etc.
43	Historical Site ID	Varchar(13)	**Conditional field** – Populated if site was transferred from one WSP to another.

Sequence	Field	Data type/size	Description
44	Affiliated Site ID	Varchar(13)	**Optional field** – To alert a retailer that the Site IDs are affiliated.
45	Tariff Rate Code	Varchar(20)	**Conditional field** – If the site has been assigned a tariff rate code, this field is mandatory. Wire owners tariff rate code for the site.
46	Meter Number	Varchar(20)	**Conditional field** – If there is a meter installed at the site, this field is mandatory; otherwise this field is [null]. Identifies the meter number currently at the site.

9.5 Transaction principles

9.5.1 Rejected by transaction not by file

Only transactions that fail validation are rejected, not the entire file. The sender is notified by reason code for each failed transaction. If the file is corrupted, the complete file will be rejected. The receiver will notify the sender of problems on a per transaction basis as soon as practical.

9.5.2 No header information

To simplify file loading procedures, transaction files are to be defined without header information.

9.5.3 Transaction will not contain additional fields for custom use

To keep the transactions standard, fields can only be added or removed if approved by the Commission in consultation with stakeholders.

9.5.4 Transactions will not contain descriptive fields

(1) To prevent potential misuse and to limit the complexity of transaction creation, descriptive fields are not allowed. For example, an Other Reject Reason Description field with a data-type definition of Varchar(80) would not be allowed.

(2) The following transactions and specific fields are exempt from this principle:

(a) ENR – Message to WSP field.

(b) DER – Message to WSP field.

(c) ROR – Meter Access Instructions field.

(d) ROC – Off-cycle Incomplete Reason field.

9.5.5 Transaction file contents

No more than one transaction type will be contained in a file.

9.6 Provincial standard transactions

The following transactions are standard in content, packaging and delivery method. They must be delivered in CSV format via the Internet. Additional delivery methods may be built as long as this method is supported.

9.6.1 Provide current consumption data from MDM

Retailers are to receive metering data at the site level, unless they have a bilateral agreement with the MDM to provide the totalized data at the socket level. Load settlement settles at the site level and is to receive the metering data at the site level.

9.6.1.1 Daily interval meter readings to retailers and LSA transaction (DIM) – information requirements

(1) Gaps are not acceptable.

(2) If a record is to be replaced, a replacement interval is provided. There is no distinction that it is a replacement record.

(3) The status of the meter reading for the interval period shall be identified as estimated ("ES") if any one or more of the meters included in the reading is estimated for that interval; otherwise the status shall be identified as actual ("ME").

(4) Status flags are mandatory for inclusion with all DIM transactions.

Table 6. Daily interval meter readings to retailers and LSA transaction (DIM)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DIM"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	MDM ID	MDM ID format	**Mandatory field** – Sender (MDM responsible for reading the meter). See Appendix A, Table A-5.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer associated with the site).
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	LSA ID	LSA ID format	**Mandatory field** – Recipient (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
7	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
8	Socket ID	Socket ID format	**Optional field** - Populated at sender's discretion. See Section 9.4.6.13.
9	Load Research Flag	Char(1)	**Mandatory field** – A Yes ("Y") or No ("N") flag noting a customer in the load research sample.
10	Profiling Class	Varchar(20)	**Optional field** – Populated at the sender's discretion.
11	kW	Number(10,4)	**Mandatory field** – Kilowatt demand for the interval period.
12	kWh	Number(10,4)	**Mandatory field** – Kilowatt hour consumption for the interval period.
13	kVA	Number(10,4)	**Mandatory field** – Kilovolt-ampere demand for the interval period.
14	kVAh	Number(10,4)	**Mandatory field** – Kilovolt-ampere hour consumption for the interval period.
15	kVAR	Number(10,4)	**Mandatory field** – Kilovolt-ampere reactive demand for the interval period.
16	kVARh	Number(10,4)	**Mandatory field** – Kilovolt-ampere reactive hour consumption for the interval period.
17	Date Time	Date time format	**Mandatory field** – End date and time for the reading.
18	Interval Period	Number(4)	**Mandatory field** – Number of minutes between readings.
19	Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described Section 9.4.6.3(2)(b).
20	Demand Status (KW)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated

Sequence	Field	Data type/size	Description
21	Consumption Status (kWh)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
22	Demand Status (kVA)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
23	Demand Status (kVAh)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
24	Demand Status (kVAR)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
25	Demand Status (kVARh)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
26	Transaction Status Code	Char(4)	**Conditional field** - If the transaction is being sent by the MDM, this field is [null]; otherwise this field is mandatory when a retailer or the LSA is sending the transaction to notify the MDM of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.1.2 Micro-generation interval meter readings to retailers transaction (GIM) – information requirements

(1) This transaction is used for reporting electric energy supplied out of the large micro-generator sites.

(2) Each transaction is sent to the retailer identified in the transaction.

(3) The transaction is required only while the site is energized and the micro-generator site is commissioned. Gaps during such periods are unacceptable.

(4) If a record is to be replaced, a replacement interval is provided. There is no distinction that it is a replacement record.

(5) The status of the meter reading for the interval period shall be identified as estimated ("ES") if any one or more of the meters included in the reading is estimated for that interval; otherwise the status shall be identified as actual ("ME").

(6) Status flags are mandatory for inclusion with all GIM transactions.

(7) GIM and DSM volumes must equal for the same asset ID and same period.

Table 7. Micro-generation interval meter readings to retailers transaction (GIM)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"GIM"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	MDM ID	MDM ID format	**Mandatory field** – Sender (MDM responsible for reading the meter). See Appendix A, Table A-5.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer associated with the site).
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.

Sequence	Field	Data type/size	Description
7	Socket ID	Socket ID format	**Optional field** - Populated at sender's discretion. See Section 9.4.6.13.
8	Asset ID	Varchar(10)	**Mandatory field** – Identifier assigned by the ISO to the micro-generator.
9	kW	Number(10,4)	**Mandatory field** – Kilowatt demand supplied out of the site for the interval period.
10	kWh	Number(10,4)	**Mandatory field** – Kilowatt hour energy supplied out of the site for the interval period.
11	Date Time	Date time format	**Mandatory field** – End date and time for the reading.
12	Interval Period	Number(4)	**Mandatory field** – Number of minutes between readings.
13	Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described Section 9.4.6.3(2)(b).
14	Demand Status (KW)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
15	Energy Status (kWh)	Char(2)	**Mandatory field** – Describes the type of meter reading. "ME" – Actual from meter "ES" – Estimated
16	Transaction Status Code	Char(4)	**Conditional field** – If the transaction is being sent by the MDM, this field is [null]; otherwise this field is mandatory when a retailer is sending the transaction to notify the MDM of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.1.3 Daily cumulative meter consumption to retailers and LSA transaction (DCM) – information requirements

(1) DCM date time usage:

(a) The Transaction Date Time field of the DCM shall be populated with the later of the time the transaction was created and the time it was last modified.

(b) The Current Reading Date Time field of the DCM shall be populated with actual or deemed values, at the discretion of the MDM. If a deemed value is used, the date shall be the date the meter was actually read.

(c) The Last Reading Date Time field of the DCM must be identical to the Current Reading Date Time field of the prior DCM for the same site except when the energize status of a site has changed.

(d) There must be a difference between the Last Reading Date Time field and the Current Reading Date Time field of the same DCM transaction.

(e) Gaps between the Last Reading Date Time field of a DCM transaction and the Current Reading Date Time field of the prior DCM transaction are only permitted when a site is in a de-energized state.

(f) The Last Meter Dial Reading field of a DCM transaction must be identical to the Current Meter Dial Reading field from the prior DCM transaction, when the meter is unchanged.

(2) DCM rejection rules:

(a) Tests

Notwithstanding file or format errors, an LSA may only reject a DCM record on the basis of:

(i) overlaps

(ii) negative usage

(b) Rejection process

(i) LSA overlaps and negative usage errors

- When the LSA rejects a DCM due to the conditions identified in Section 9.6.1.3(2)(a), the LSA shall notify the MDM within two business days of excluding the DCM from load settlement.
- Only the records rejected on the basis of file or format errors will be returned using the same file name under which it was received but with an appended "R" as per Section 9.4.2(3). Each rejected record will contain the reason for the rejection of that record in the Transaction Status Code field.
- When a DCM is rejected and the rejection reason in the Transaction Status Code field is for one of the tests in Section 9.6.1.3(2)(a), the MDM shall send a cancel DCM as per Section 9.6.1.3(3) within one business day to the LSA and retailers.

(ii) Retailer rejection process for content errors

- Retailers shall notify the LSA for all errors other than file or format errors.

(3) DCM cancellation:

(a) Single DCM cancellation

(i) The MDM will indicate specifically which record to cancel by sending a cancellation DCM indicated by "CA" in the Record Status field. All cancellation DCM fields should match exactly to the DCM to be cancelled except for the following fields:

- Transaction Date Time
- Record Status
- Transaction Status Code

(ii) Records with a "CA" status should appear first in every file.

(iii) A DCM that is generated from two valid meter reads shall not be cancelled and replaced after final settlement unless one of the two meter reads that feed into the DCM is considered invalid according to Measurement Canada's guidelines.

(b) Multi-DCM cancellation

(i) Multi-DCM cancellation will be used at the discretion of the MDM, where a single DCM cancellation may not resolve the issue.

(ii) Multi-DCM cancellation will only be used for replacement of data for a specific site and not for multiple sites.

(c) DCM status flags

Refer to Table A-7 DCM and GCM status flag codes in Appendix A.

(4) DCM provision during retailer switch:

Where no meter reading exists at the time a customer with cumulative meter switches retailers, the MDM shall provide the next actual meter read that becomes available to all retailers that served the customer since the previous actual meter read.

Table 8. Daily cumulative meter consumption to retailers and LSA transaction (DCM)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DCM"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	MDM ID	MDM ID format	**Mandatory field** – Sender (MDM responsible for reading the meter). See Appendix A, Table A-5
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer associated with the site).
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	LSA ID	LSA ID format	**Mandatory field** – Recipient (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
7	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
8	Socket ID	Socket ID format	**Optional field** - Populated at sender's discretion. See Section 9.4.6.13.
9	Meter Number	Varchar(20)	**Conditional field** – If the site has a cumulative meter, this field is mandatory. If the site is unmetered this field is [null].
10	kWh	Number(12,4)	**Mandatory field** – Kilowatt hour consumption for period.
11	Max kVA	Number(8,2)	**Conditional field** – If Max Reading (Voltamp) field is populated, this field is mandatory. Demand in kilovolt amps for period.
12	Max kW	Number(8,2)	**Conditional field** – If Max Reading (Watt) is populated, this field is mandatory. Demand in kilowatts for period.
13	Last Reading Date Time	Date time format	**Mandatory field** – Date and time of the last reading.
14	Current Reading Date Time	Date time format	**Mandatory field** – Date and time of the current reading.
15	Last Meter Dial Reading	Number(10)	**Conditional field** – If the site has a cumulative meter, this field is mandatory. If the site is unmetered, this field is [null].
16	Current Meter Dial Reading	Number(10)	**Conditional field** – If the site has a cumulative meter, this field is mandatory. If the site is unmetered, this field is [null].
17	Max Reading (Watt)	Number(6)	**Optional field** - Populated at sender's discretion. Used to derive the demand in kW. For example, if Max Reading = 100 and the Meter Multiplier = 200, then Max kW = (100 x 200)/1,000 or Max kW = 20.
18	Max Reading (Voltamp)	Number(6)	**Optional field** - Populated at sender's discreti on. Used to derive the demand in kVA. For example, if Max Reading = 100 and the Meter Multiplier = 200, Max kVA = (100 x 200)/1,000 or Max kVA = 20.
19	Meter Multiplier	Number(14,9)	**Conditional field** – If the site has a cumulative meter, this field is mandatory. If the site is unmetered, this field is [null].
20	Consumption Status (kWh)	Char(2)	**Mandatory field** – Describes the type of meter reading. Refer to Table A-7 DCM and GCM status flag codes in Appendix A.
21	Demand Status (kVA)	Char(2)	**Conditional field** – If Max kVA and Max Reading (Voltamp) fields are populated, this field is mandatory. Describes the type of meter reading. Refer to Table A-7 DCM and GCM status flag codes in Appendix A.
22	Demand Status (kW)	Char(2)	**Conditional field** – If Max kW and Max Reading (Watt) fields are populated, this field is mandatory. Describes the type of meter reading. Refer to Table A-7 DCM and GCM status flag codes in Appendix A.
23	Record Status	Char(2)	**Conditional field** – If the meter reading is being cancelled, this field is mandatory. "CA" – Cancelled. This code indicates that the receiver should cancel its version of this exact record. Sending this record eliminates confusion over the replacement record, especially when the replacement record may not cover the same period as this cancelled record.

Sequence	Field	Data type/size	Description
24	Transaction Status Code	Char(4)	**Conditional field** – If the transaction is being sent by the MDM, this field is [null]; otherwise this field is mandatory when a retailer or the LSA is sending the transaction to notify the MDM of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.1.4 Micro-generation cumulative meter reading to retailers transaction (GCM) – information requirements

(1) GCM date time usage:

(a) The Transaction Date Time field shall be populated with the later of the time the transaction was created or last modified.

(b) The Current Reading Date Time field of the GCM shall be populated with actual or deemed values, at the discretion of the MDM. If a deemed value is used, the date shall be the date the meter was actually read.

(c) The Last Reading Date Time field of the GCM must be the identical to the Current Reading Date Time field of the prior GCM for the same site, except when the energize status of a site has changed.

(d) There must be a difference between the Last Reading Date Time field and the Current Reading Date Time field of the same GCM transaction.

(e) Gaps between the Last Reading Date Time field of a GCM transaction and the Current Reading Date Time field of the prior GCM transaction are only permitted when a site is in a de-energized state or the micro-generator site is decommissioned.

(f) The Last Meter Dial Reading field of a GCM transaction must be identical to the Current Meter Dial Reading field from the prior GCM transaction when the meter is unchanged.

(2) GCM data provision:

(a) In the event of a retailer switch during the meter reading period, the MDM shall provide the meter read to the retailers.

(3) GCM cancellation:

(a) Single GCM cancellation

(i) The MDM will indicate specifically which record to cancel by sending a cancellation GCM indicated by “CA” in the Record Status field. All cancellation GCM fields should match exactly to the GCM to be cancelled except for the following fields:

- Transaction Date Time
- Record Status
- Transaction Status Code

(ii) Records with a “CA” status should appear first in every file.

(b) GCM status flags

Refer to Table A-7 DCM and GCM status flag codes in Appendix A.

Table 9. Micro-generation cumulative meter reading to retailers transaction (GCM)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"GCM"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	MDM ID	MDM ID format	**Mandatory field** – Sender (MDM responsible for reading the meter). See Appendix A, Table A-5.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer associated with the site).
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Meter Number	Varchar(20)	**Mandatory field** – Meter number of the meter installed.
8	kWh	Number(12,4)	**Mandatory field** – Kilowatt hour energy supplied out of the site between the last and current readings.
9	Last Reading Date Time	Date time format	**Mandatory field** – Date and time of the last reading.
10	Current Reading Date Time	Date time format	**Mandatory field** – Date and time of the current reading.
11	Last Meter Dial Reading	Number(10)	**Mandatory field** – The previous dial reading taken from the meter.
12	Current Meter Dial Reading	Number(10)	**Mandatory field** – The current dial reading taken from the meter.
13	Meter Multiplier	Number(14,9)	**Mandatory field** – Multiplier used to calculate the energy supplied out of the site.
14	Energy Status (kWh)	Char(2)	**Mandatory field** – Describes the type of meter reading. Refer to Table A-7 DCM and GCM status flag codes Appendix A.
15	Record Status	Char(2)	**Conditional field** – If the meter reading is being cancelled, this field is mandatory. "CA" – Cancelled. This code indicates that the receiver should cancel its version of this exact record. Sending this record eliminates confusion over the replacement record, especially when the replacement record may not cover the same period as this cancelled record.
16	Transaction Status Code	Char(4)	**Conditional field** - If the transaction is being sent by the MDM, this field is [null]; otherwise this field is mandatory when a retailer is sending the transaction to notify the MDM of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.2 Wholesale settlement data transfers

9.6.2.1 Wholesale settlement information transaction (WSI) – information requirements

(1) Transactions that are sent to retailers are sent to the specific retailers only.

(2) Transactions that are sent to the ISO include data for all retailers.

(3) Transactions that are sent to disclose load settlement information aggregated for the client WSP's sites will be sent to the client WSP, e.g. REA.

(4) The WSI files must be provided to the ISO using the ISO ID for financial purposes as described in Section 9.4.6.9.

Table 10. Wholesale settlement information transaction (WSI)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"WSI"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.

Sequence	Field	Data type/size	Description
3	LSA ID	LSA ID format	**Mandatory field** – Sender (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
4	ISO Financial ID	ISO financial ID format	**Conditional field** – Mandatory if the ISO is the intended recipient; otherwise optional. ISO financial ID "3000."
5	Retailer ID	Retailer ID format	**Conditional field** – Mandatory if the retailer is the intended recipient; otherwise optional. Retailer associated with the site.
6	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
7	Zone ID	Zone ID format	**Mandatory field** – Settlement zone ID where load is being settled. See Appendix A, Table A-6.
8	WSP ID	WSP ID format	**Conditional field** – Mandatory if the WSP is the intended recipient; otherwise optional. WSP responsible for the site. See Appendix A, Table A-3.
9	Settlement Run Date Time	Date time format	**Mandatory field** – Date and time settlement was initiated. This date does not indicate which data was used by the settlement run.
10	Settlement As At Date Time	Date time format	**Mandatory field** – Date and time all data used by this settlement run was in the settlement system. Supports reproducibility of settlement at a later time than the original settlement run. This allows the same data to be used regardless of how many times a run is performed.
11	Settlement Type	Char(1)	**Mandatory field** – "I," "M," "R" or "F" for daily, monthly, interim and final settlement runs respectively.
12	Profile Cut-off Date	Date time format	**Mandatory field** – Date and time specifying the last point at which data is included for profile generation.
13	Settlement Interval Ending Time	Date time format	**Mandatory field** – Date and time of the interval the settlement data is for.
14	Interval Period	Number(4)	**Mandatory field** – Number of minutes in the interval period. "60" is the current standard.
15	Settlement Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described Section 9.4.6.3(2)(b).
16	Retailer Total Usage (kWh)	Number(12,4)	**Mandatory field** – Total of the consumption for all of the retailer's sites.
17	Retailer Loss Total (kWh)	Number(12,4)	**Mandatory field** – Total of the losses allocated to all of the retailer's sites.
18	Retailer UFE Total (kWh)	Number(12,4)	**Mandatory field** – Total of the UFE allocated to all of the retailer's sites.
19	Retailer Energy Grand Total (MWh)	Number(12,7)	**Mandatory field** – Total of the consumption, line loss and UFE for the retailer in MWh for the ISO.
20	Transaction Status Code	Char(4)	**Conditional field** – If the transaction is being sent by the LSA, this field is [null]; otherwise this field is mandatory when a retailer, the ISO or the WSP is sending the transaction to notify the LSA of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.2.2 Settlement summary information transaction (SSI) – information requirements

(1) This transaction will not be directed to a specific retailer but will be made available to all retailers.

(2) The SSI files must be provided to the ISO using the ISO ID for financial purposes as described in Section 9.4.6.9.

Table 11. Settlement summary information transaction (SSI)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SSI"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender (LSA responsible for settling the load within the zone). See Appendix A, Table A-4
4	Zone ID	Zone ID format	**Mandatory field** – Settlement zone ID where load is being settled. See Appendix A, Table A-6.
5	Settlement Run Date Time	Date time format	**Mandatory field** – Date and time settlement was initiated. This date does not indicate which data was used by the settlement run.
6	Settlement As At Date Time	Date time format	**Mandatory field** – Date and time all data used by this settlement run was in the settlement system. Supports reproducibility of settlement at a later time than the original settlement run. This allows the same data to be used regardless of how many times a run is performed.
7	Settlement Type	Char(1)	**Mandatory field** – "I," "M," "R" or "F" for daily, monthly, interim and final settlement runs respectively.
8	Profile Cut-off Date	Date time format	**Mandatory field** – Date and time specifying the last point at which data is included for profile generation.
9	Settlement Interval Ending Time	Date time format	**Mandatory field** – Date and time of the interval the settlement data is for.
10	Interval Period	Number(4)	**Mandatory field** – Number of minutes in the interval period. "60" is the current standard.
11	Settlement Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described Section 9.4.6.3(2)(b).
12	Zone POD Load Total (kWh)	Number(12,4)	**Mandatory field** – Total of the consumption for the settlement zone (sum of the POD loads).
13	Zone Retailer Load Total (kWh)	Number(12,4)	**Mandatory field** – Sum of retailer allocated loads, excluding losses and UFE.
14	Zone Loss Total (kWh)	Number(12,4)	**Mandatory field** – Total of loss allocations to retailers for the settlement zone.
15	Zone UFE Total (kWh)	Number(12,4)	**Mandatory field** – Total of UFE allocations to retailers for the settlement zone.
16	Zone Loss Per Cent of Retailer Load	Number(6,4)	**Mandatory field** – Zone loss as a per cent of zone retailer allocated load less transmission-connected site load.
17	Zone UFE Per Cent of Retailer Load	Number(6,4)	**Mandatory field** – Zone UFE as a per cent of zone retailer allocated load less direct-connect load.
18	Zone Reconciliation Error (kWh)	Signed Number(12,4)	**Mandatory field** – Zone POD load total – (zone retailer load total + zone loss total + zone UFE total). This should be zero except for rounding error.

9.6.2.3 Settlement profile information transaction (SPI) – information requirements

(1) SPIs will not be directed to a specific retailer but will be made available to all retailers.

(2) This transaction is sent out with the same timing as the WSI transaction following each settlement run.

(3) For each profiling type or profiling class, the Hourly Value (kWh) field includes all profile values used in the settlement run.

(4) Hourly values for a given profile will be sent out the first time they are used in a settlement run. Profiles that are frozen will be sent out only once.

Table 12. Settlement profile information transaction (SPI)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SPI"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
4	Zone ID	Zone ID format	**Mandatory field** – Settlement zone ID where load is being settled. See Appendix A, Table A-67.
5	Settlement Run Date Time	Date time format	**Mandatory field** – Date and time settlement was initiated. This date does not indicate which data was used by the settlement run.
6	Settlement As At Date Time	Date time format	**Mandatory field** – As at date and time of the settlement run that used the profiles. Identifies the settlement these profiles are for.
7	Settlement Type	Char(1)	**Mandatory field** – "I," "M," "R" or "F" for daily, monthly, interim and final settlement runs respectively.
8	Profile Type	Varchar(20)	**Mandatory field** – Type of profile (e.g. "NSLS," "Sample")
9	Profiling Class	Varchar(20)	**Mandatory field** – Profiling class, if for a specific class.
10	Settlement Interval Ending Time	Date time format	**Mandatory field** – Date and time of the interval the settlement data is for.
11	Interval Period	Number(4)	**Mandatory field** – Number of minutes in the interval period. "60" is the current standard.
12	Settlement Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described Section 9.4.6.3(2)(b).
13	Profile Create Date	Date time format	**Mandatory field** – Date and time the profile was created for this hour. It is equal to the Settlement As At Date Time if profile freezing is not in effect. If profile freezing is in effect it is equal to a date earlier than or equal to the Settlement As At Date Time.
14	Hourly Value (kWh)	Number(12,4)	**Mandatory field** – Value of the energy used by this profiling class or an average usage by a site of this profiling class, as long as the meaning of the value is consistent from day to day for the LSA.

9.6.2.4 System-level measurement data provision

The following transaction format shall be used for the provision of system level measurement data by the MDM to the LSA and the ISO as indicated within each section. Note however, that when the interface between MDM and LSA is within the same WSP, the format and content is a WSP decision.

9.6.2.4.1 Daily system measurement transaction (DSM) – information requirements

(1) This format became effective February 1, 2006.

(2) The DSM files must be provided to the ISO using the ISO ID for financial purposes as described in Section 9.4.6.9.

(3) The source flags of the meter reading for the interval period shall be identified as estimated ("E") if any one or more of the meters included in the reading is estimated; otherwise the flags shall be identified as metered ("M").

Table 13. Daily system measurement transaction (DSM)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DSM"	**Mandatory field** – Abbreviation of the transaction name.
2	Data Type	Char(3)	**Mandatory field** – Metering data transaction type. Format: "GEN" Transmission generation – generation connected to the transmission system. Distributed generation – generation connected to the distribution system. Isolated generation – generation providing energy to isolated communities that are not connected to the AIES. Border supply – energy supplied by an extra-provincial supplier to customers in Alberta not connected to the AIES. "EDG" Reversing loads – energy flow from the distribution system into the transmission system. "LOD" Transmission loads – points of delivery to the distribution system from the transmission system. Isolated loads – points of delivery to isolated communities from isolated generation. "IMP" Provincial imports – energy supplied by an extra-provincial transmission system to the AIES. Zone imports – energy that is transferred into one load settlement zone from another load settlement zone. "EXP" Provincial export – energy supplied to an extra-provincial transmission system from the AIES. Zone exports – energy that is transferred out of one load settlement zone to another load settlement zone. "POT" Duplication avoidance transfers – energy that is transferred between customer generation and load facilities, wheeled across the AIES.
3	Data Date	Date format	**Mandatory field** – Date of energy flow of metering data.
4	Data Hour	Number(2)	**Mandatory field** – Hour ending for the hour of energy flow of metering data. Example: "1" = 00:00 to 01:00. For periods of energy flow occurring before November 1, 2026, ~~H~~hour ending for the hour of energy flow of metering data, numbered from 1 to 24 (except on the first day of daylight time when they are numbered from 1 to 23 and on the first day of standard time when they are numbered from 1 to 25). ~~Example: "1" = 00:00 to 01:00.~~ For periods of energy flow occurring on or after November 1, 2026, hour ending shall be numbered from 1 to 24.
5	Data interval	Number(2)	**Mandatory field** – 15-minute interval of energy flow of metering data, where "1" = the first 15 minutes in the hour and "4" = the last 15 minutes in the hour.
6	Measurement Point ID	Varchar(10)	**Mandatory field** – Measurement point identifier as assigned in advance by the ISO. Examples: "RD14S," "S07," "366S001," "000021401," "ADEC"
7	MWh	Number(12,7)	**Mandatory field** – Net active energy transferred in the interval (positive and zero values only).
8	MWh Source	Char(1)	**Mandatory field** – Net active energy source flag.

Sequence	Field	Data type/size	Description
			"M" = Metered "E" = Estimated
9	MVARh	Number(12,7)	**Mandatory field** – Net reactive energy transferred in the interval (signed values only).
10	MVARh Source	Char(1)	**Mandatory field** – Net reactive energy source flag. "M" = Metered "E" = Estimated

9.6.2.5 Wholesale settlement summary transaction (WSS) – information requirements

(1) This transaction is a control report, providing a monthly summation. The WSS report is sent in conjunction with the WSI transaction containing the settlement data for the last calendar day of the month. The WSS is required for monthly, interim and final settlement only (not daily settlement).

(2) Transactions that are sent to retailers are sent to the specific retailers only.

(3) Transactions that are sent to the ISO include data for all retailers.

(4) The WSS files must be provided to the ISO using the ISO ID for financial purposes as described in Section 9.4.6.9.

Table 14. Wholesale settlement summary transaction (WSS)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"WSS"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
4	ISO Financial ID	ISO financial ID format	**Conditional field** – Mandatory if the ISO is the intended recipient; otherwise optional. ISO financial ID "3000."
5	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer associated with the site).
6	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
7	Zone ID	Zone ID format	**Mandatory field** – Settlement zone ID where load is being settled. See Appendix A, Table A-6.
8	Settlement Type	Char(1)	**Mandatory field** – "M," "R" and "F" for monthly, interim or final settlement runs respectively.
9	Settlement Month	Number(6)	**Mandatory field** – Four-digit year and two-digit month of the settlement data being summarized.
10	Retailer Usage Total (kWh)	Number(17,4)	**Mandatory field** – Total of the consumption for all of the retailer's sites in the month.
11	Retailer Loss Total (kWh)	Number(17,4)	**Mandatory field** – Total of the losses allocated to all of the retailer's sites in the month.
12	Retailer UFE Total (kWh)	Number(17,4)	**Mandatory field** – Total of the UFE allocated to all of the retailer's sites in the month.
13	Retailer Energy Grand Total (MWh)	Number(17,7)	**Mandatory field** – Total of the consumption, line loss and UFE for the retailer's sites in the month.
14	Transaction Status Code	Char(4)	**Conditional field** - If the transaction is being sent by the LSA, this field is [null]; otherwise this field is mandatory when a retailer or the ISO is sending the transaction to notify the LSA of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.2.6 Wholesale settlement details for retailers own sites transaction (WSD) – information requirements

(1) This transaction provides daily site-specific settlement results for daily, monthly, interim and final settlement to retailers for energized sites which are enrolled to that retailer.

(2) The site characteristics in this transaction are those characteristics in effect at the end of the load settlement day.

Table 15. Wholesale settlement details for retailers own sites transaction (WSD)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"WSD"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer associated with the site).
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Zone ID	Zone ID format	**Mandatory field** – Settlement zone ID where load is being settled. See Appendix A, Table A-6.
8	Settlement Run Date Time	Date time format	**Mandatory field** – Date and time settlement was initiated. This date does not indicate which data was used by the settlement run.
9	Settlement As At Date Time	Date time format	**Mandatory field** – Date and time all data used by this settlement run was in the settlement system. Supports reproducibility of settlement at a later time than the original settlement run. This allows the same data to be used regardless of how many times a run is executed.
10	Settlement Type	Char(1)	**Mandatory field** – "I," "M," "R" or "F" for daily, monthly, interim and final settlement runs respectively.
11	Profile Cut-off Date	Date time format	**Mandatory field** – Date and time specifying the last point at which data is included for profile generation.
12	Settlement Date	Date format	**Mandatory field** – The effective date of power flow and site characteristics that the transaction is for.
13	Profiling Class	Varchar(20)	**Conditional field** – If the site is settled using interval data, this field is optional; otherwise this field is mandatory.
14	Loss Group Code	Varchar(10)	**Mandatory field** – The site's loss group code.
15	Unmetered Indicator	Char(1)	**Optional field** – Populated at sender's discretion. If the site is unmetered, then the value must equal "U." If the site is metered, this field is [null].
16	Daily Site Usage (kWh)	Number(12,4)	**Mandatory field** – Settled kilowatt hour consumption for the site for the day (before loss and UFE allocation).
17	Result Source	Char(1)	**Mandatory field** – Daily Site Usage (kWh) field was calculated using: "M" – DIM or DCM containing any hour of settlement data "E" – LSA-generated consumption estimate.
18	Daily Site Loss (kWh)	Number(12,4)	**Mandatory field** – Settled loss allocation for the site for the day.
19	Daily Site UFE (kWh)	Number(12,4)	**Mandatory field** – Settled UFE allocation for the site for the day.
20	Weather Station Identifier	Varchar(20)	**Optional field for electric distributors** - Populated at sender's discretion. **Mandatory field for gas distributors** – Weather station identifier for site.
21	Estimation Methodology	Char(1)	**Mandatory field** – Reference code to estimation methodology used by the LSA to create consumption estimate for this site. Examples of estimation are to be made public. Values are: "U" – Usage factor "A" – Average daily usage

Sequence	Field	Data type/size	Description
22	Transaction Status Code	Char(4)	**Conditional field** – If the transaction is being sent by the LSA, this field is [null]; otherwise this field is mandatory when a retailer is sending the transaction to notify the LSA of problem with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.2.7 Wholesale class information transaction (WCI) – information requirements

(1) LSAs that provide load settlement services for WSPs and utilize dynamically calculated losses will use this transaction.

Table 16. Wholesale class information transaction (WCI)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"WCI"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender (LSA responsible for settling the load within the zone). See Appendix A, Table A-4.
4	ISO Financial ID	ISO financial ID format	**Conditional field** – Mandatory if the ISO is the intended recipient; otherwise optional. ISO financial ID "3000."
5	Retailer ID	Retailer ID format	**Conditional field** – Mandatory if the retailer is the intended recipient; otherwise optional. Retailer associated with the site.
6	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
7	Zone ID	Zone ID format	**Mandatory field** – Settlement zone ID where load is being settled. See Appendix A, Table A-6.
8	WSP ID	WSP ID format	**Conditional field** – Mandatory if the WSP is the intended recipient; otherwise optional. WSP responsible for the site. See Appendix A, Table A-3.
9	Loss Group Code	Varchar(10)	**Mandatory field** – Loss group code.
10	Profiling Class	Varchar(20)	**Mandatory field** – Load profiling class.
11	Settlement Run Date Time	Date time format	**Mandatory field** – Date and time settlement was initiated. This date does not indicate which data was used by the settlement run.
12	Settlement As At Date Time	Date time format	**Mandatory field** – Date and time all data used by this settlement run was in the settlement system. Supports reproducibility of settlement at a later time than the original settlement run. This allows the same data to be used regardless of how many times a run is performed.
13	Settlement Type	Char(1)	**Mandatory field** – "M," "R" or "F" for monthly, interim and final settlement runs respectively.
14	Profile Cut-off Date	Date time format	**Mandatory field** – Date and time specifying the last point at which data is included for profile generation.
15	Settlement Interval Ending Time	Date time format	**Mandatory field** – Date and time of the interval the settlement data is for.
16	Interval Period	Number(4)	**Mandatory field** – Number of minutes in the interval period. "60" is the current standard.
17	Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described in Section 9.4.6.3(2)(b).
18	Retailer Usage Total (kWh)	Number(12,4)	**Mandatory field** – Total of the consumption for all of the retailer's sites in the loss group and profile class.
19	Retailer Loss Total (kWh)	Number(12,4)	**Mandatory field** – Total of the losses allocated to all the retailer's sites in the loss group and profile class.
20	Retailer UFE Total (kWh)	Number(12,4)	**Mandatory field** – Total of the UFE allocated to all the retailer's sites in the loss group and profile class.

Sequence	Field	Data type/size	Description
21	Retailer Energy Grand Total (MWh)	Number(12,7)	**Mandatory field** – Total of the consumption, line loss and UFE for the retailer's sites in the loss group and profile class.
22	Transaction Status Code	Char(4)	**Conditional field** - If the transaction is being sent by the LSA, this field is [null]; otherwise this field is mandatory when a retailer, the ISO or the WSP is sending the transaction to notify the LSA of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.3 Select retailer transaction set

9.6.3.1 Select retailer request transaction (SRR) – information requirements

(1) The retailer shall send an update customer information transaction (UCI), as detailed in Section 9.6.4, with an SRR for the site to be enrolled. The UCI must be populated as per Section 9.6.4.

(2) The LSA may reject an enrolment if a UCI is not received. An enrolment may not be rejected on the basis of a failed UCI. The LSA's validation process for enrolment may only include that a populated UCI was received.

(3) If the UCI in question is rejected by the WSP, the retailer must send a corrected UCI within one business day of the effective date of the enrolment. For example, if a site becomes effective at 00:00 on March 27, and the UCI is rejected due to transaction errors, the retailer must send a corrected UCI by 00:00 on March 28.

Table 17. Select retailer request transaction (SRR)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SRR"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender (enrolling retailer).
4	Business Function ID	Varchar(2)	**Mandatory field** - See Appendix A, Table A-2.
5	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
6	LSA ID	LSA ID format	**Mandatory field** – Recipient. See Appendix A, Table A-4.
7	Priority Code	Char(1)	**Mandatory field** – The only value acceptable is: "1" – Next day
8		[null]	Field not used.
9	Retailer Account Number	Varchar(30)	**Optional field** – Account number by which a retailer identifies a site.
10	Retailer Reference Number	Varchar(20)	**Optional field** – Identification number assigned by the retailer.

9.6.3.2 Select retailer notification transaction (SRN) – content

Table 18. Select retailer notification transaction (SRN)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SRN"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender. See Appendix A, Table A-4.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient, retailer that sent the SRR.

Sequence	Field	Data type/size	Description
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Switch Date	Date time format	**Conditional field** – If Enrolment Notification Code field = "0000" this field is mandatory; otherwise this field is [null].
8	Profiling Class	Varchar(20)	**Conditional field** – If: (i) Enrolment Notification Code field = "0000"; (ii) the site is not settled using interval data and (iii) the profiling class has been assigned to the site, this field is mandatory. If Enrolment Notification Code field ≠ "0000" or the profiling class has not been assigned to the site, this field is [null]. If Enrolment Notification Code field = "0000" and the site is settled using interval data, this field is optional.
9	Loss Group Code	Varchar(10)	**Conditional field** – If: (i) Enrolment Notification Code field = "0000"; (ii) the site is not settled using interval data and (iii) the loss group code has been assigned to the site, this field is mandatory. If Enrolment Notification Code field ≠ "0000" or the loss group code has not been assigned to the site, this field is [null]. If Enrolment Notification Code field = "0000" and the site is settled using interval data, this field is optional.
10	Enrolment Notification Code	Char(4)	**Mandatory field** – Provides notification to the retailer that its enrolment request was successful or failed using a transaction status code from Appendix A, Table A-8.
11	Retailer Account Number	Varchar(30)	**Conditional field** – Account number by which a retailer identifies a site. If provided in the SRR this field is mandatory; otherwise this field is [null].
12	Retailer Reference Number	Varchar(20)	**Conditional field** – Identification number assigned by the retailer. If provided in the SRR this field is mandatory; otherwise this field is [null].
13	Energized Indicator	Char(1)	**Conditional field** – If Enrolment Notification Code field = "0000" this field is mandatory; otherwise this field is [null]. Values are: "Y" – Energized "N" – De-energized "L" – Load limiter installed Values are based on LSA's energization status at the time of creation of the SRN and are not intended for settlement balancing purposes.

9.6.3.3 Notify old retailer transaction (SRO) – information requirements

This transaction is sent from the LSA to the old retailer to notify them of loss of a site.

Table 19. Notify old retailer transaction (SRO)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SRO"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender. See Appendix A, Table A-4.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (old retailer).
5	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Switch Date	Date time format	**Mandatory field** – Date and time the old retailer is no longer connected to the site (no longer responsible for the load). Time will be the first hour of the day.
8	Reason for Loss of the Site	Char(4)	**Conditional field** – If the site has been removed or is scheduled to be removed from the site ID catalogue, populate with "0001"; otherwise this field is [null].
9	Old Retailer Account Number	Varchar(30)	**Optional field** – Account number by which old retailer identifies a site.

9.6.3.4 LSA notify wires and MDM transaction (SRW) – content

Table 20. LSA notify wires and MDM transaction (SRW)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SRW"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender. See Appendix A, Table A-4.
4	WSP ID	WSP ID format	**Mandatory field** – Recipient (WSP responsible for the site). See Appendix A, Table A-3
5	MDM ID	MDM ID format	**Mandatory field** – Recipient (MDM responsible for reading the meter). See Appendix A, Table A-5.
6	Retailer ID	Retailer ID format	**Mandatory field** – Chosen new retailer.
7	Business Function ID	Varchar(2)	**Optional field** - Populated at sender's discretion. See Appendix A, Table A-2.
8	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
9	Switch Date	Date time format	**Mandatory field** – Date and time site was allocated to the retailer. Time will be the first hour of the day.

9.6.3.5 Micro-generation retailer notification transaction (GRN) – information requirements

(1) The GRN transaction consists of information about the micro-generator site setup. In the case of a grouped site, the GRN will only be issued on the parent site ID. This transaction is sent to the retailer and to the ISO:

(a) on a change in operational status (commissioned/decommissioned) at the site

(b) on a successful retailer enrolment at the site

(2) The WSP is responsible for producing this transaction and sending it to the retailer.

(3) This transaction is used in conjunction with the SMC transaction to identify the periods of time during which a complete set of GIM or GCM transactions must be provided by the MDM.

(4) A GRN transaction must be provided for a commissioned micro-generation site within five business days of a retailer switch.

Table 21. Micro-generation retailer notification transaction (GRN)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"GRN"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender. (WSP responsible for the site.) See Appendix A, Table A-3.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	Business Function ID	Varchar(2)	**Optional field** – See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Socket ID	Socket ID format	**Conditional field** – If the WSP uses socket IDs to differentiate the load side from the generation side, then this field is mandatory.
8	Asset ID	Varchar(10)	**Conditional field** – If the generation site is a large micro-generator, this field is mandatory. The Asset ID is provided by the ISO to the WSP.
9	Date Time Effective	Date time format	**Mandatory field** – Date and time the micro-generator indicator is effective.

Sequence	Field	Data type/size	Description
10	Micro Generator Indicator	Char(1)	**Mandatory field** – Values are: "Y" - Micro-generator is commissioned "N" - Micro-generator is decommissioned

9.6.4 Update customer information transaction set

9.6.4.1 Update customer information transaction (UCI) – information requirements

(1) The following UCI provisions set out requirements respecting the transfer of important customer and emergency contact information from the retailer to the WSP. This information is needed so that the WSP may execute its duties to facilitate customer transfer to the regulated rate provider or the default supplier, if either is required, and to permit safe and secure operation of the wires environment. To that end, "customer" in this section refers to the person, including a company or other legal entity, financially responsible for a site. Additionally, "site contact" refers to the individual responsible for emergency and service outage management and any other day-to-day functions at a site.

(2) A retailer must provide the information in a mandatory field in Table 22. In addition, a retailer must provide the information in a conditional field in Table 22, if it has the information required in the conditional field in its records. A retailer may provide the information in an optional field, but is not required to do so.

(3) A retailer must provide a detailed mailing address for the customer, that is the civic or rural address, unless a civic or rural address does not exist for the customer. A civic or rural address must follow the Canada Post Addressing Guidelines. For example, if an apartment number exists as a part of the civic address, the retailer must provide it.

(4) A retailer must request a telephone number and an email address from a customer and provide the information received in the appropriate fields of the UCI transaction. A retailer must populate either a telephone number field or an email address field, or both, if available for a customer upon enrolment, unless the customer was transferred to the regulated rate provider or the default supplier and this information was not available or invalid at the time of transfer. However, the regulated rate provider or the default supplier must populate these fields when the customer information becomes known and the regulated rate provider or the default supplier must resend all of the data to the WSP.

(5) In the case of a customer who has a principal and agent relationship with another person and the agent is financially responsible for the site, a retailer must populate fields 17 to 43 with the information of the agent rather than that of the principal.

(6) Update/refresh mechanism: whenever a retailer knows that any of the information set out in the UCI transaction has changed, the retailer must resend all of the data to ensure data is accurate and up to date.

Table 22. Update customer information transaction (UCI)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"UCI"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	WSP ID	WSP ID format	**Mandatory field** - Recipient (WSP responsible for the site). See Appendix A, Table A-3.
5	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.

Sequence	Field	Data type/size	Description
6	Customer Company Name	Varchar(150)	**Conditional field -** Required if it exists in the retailer's record of the customer's information. Must be [null] if Customer Last Name and Customer First Name is populated.
7	Operating as	Varchar(150)	**Optional field** – Populated at sender's discretion.
8	Customer c/o or Attention Field	Varchar(150)	**Optional field** – Populated at sender's direction. Additional delivery information e.g., Finance Department, Property Manager, etc.
9	Customer Last Name	Varchar(100)	**Conditional field -** Required if it exists in the retailer's record of the customer's information. Must be [null] if Customer Company Name is populated. Must be populated if the Company Name is [null]. "Customer" refers to the person or legal entity financially responsible for a site.
10	Customer First Name	Varchar(100)	**Conditional field -** Required if it exists in the retailer's record of the customer's information. Must be [null] if Customer Company Name is populated. Must be populated if the Company Name is [null]. "Customer" refers to the person or legal entity financially responsible for a site.
11	Customer Phone Number	Telephone Number Format	**Conditional field** – Required if it exists in the retailer's record of the customer's information and is a telephone number in Canada or the United States. See section 9.4.6.2 for example. "Customer" refers to the person or legal entity financially responsible for a site.
12	Customer Email Address	Varchar(320)	**Conditional field** – Required if it exists in the retailer's record of the customer's information. "Customer" refers to the person or legal entity responsible for a site.
13	Alternate Customer Last Name	Varchar(100)	**Conditional field** – Required if it exists in the retailer's record of the customer's information. Last name of an alternate contact. E.g., spouse, accounts payable, property manager contact person, etc.
14	Alternate Customer First Name	Varchar(100)	**Conditional field** – Required if it exists in the retailer's record of the customer's information. First name of an alternate contact. E.g., spouse, accounts payable, property manager contact person, etc.
15	Alternate Customer Phone Number	Telephone Number Format	**Conditional field** – Required if it exists in the retailer's record of the customer's information and it is a telephone number in Canada or the United States. See section 9.4.6.2 for example.
16	Alternate Customer Email Address	Varchar(320)	**Conditional field** – Required if it exists in the retailer's record of the customer's information.
17	Mailing Address Unit Designator	Varchar(15)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Used to define individual units where no unit number exists, e.g., "Back," "Basement."
18	Mailing Address Unit Number	Varchar(6)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Apartment number, etc.
19	Mailing Address House Number	Varchar(6)	**Conditional field -** Must be populated if it exists in the customer's mailing address.
20	Mailing Address Street Pre-Direction	Varchar(2)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Standard direction codes (N, W, SW, etc.) which appear in **front** of the street name, e.g., "W Georgia ST."
21	Mailing Address Street Name	Varchar(50)	**Conditional field -** Must be populated if it exists in the customer's mailing address.

Sequence	Field	Data type/size	Description
22	Mailing Address Street Type Code	Varchar(8)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Valid Canada Post codes are required.
23	Mailing Address Street Direction	Varchar(2)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Standard direction codes (N, W, SW, etc.) which appear **after** the street name, e.g., "Millwood RD W."
24	Mailing Address City Quadrant	Varchar(2)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Standard direction codes (N, W, SW, etc.) which designate a quadrant of a city.
25	Mailing Address General Delivery Indicator	Char(1)	**Conditional field -** Must be populated if it exists in the customer's mailing address. "Y" – If site has a general delivery address [Null] if no general delivery address is used. Address is formatted as: "GD Drayton Valley, AB T0E 0M0"
26	Mailing Address Lot ID	Varchar(10)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Example: (54 is the Lot ID) "54 26540 Range RD 11 Red Deer County AB T4E 1A3"
27	Mailing Address Pre-Road Number	Varchar(10)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Number that appears before the road type in the Canada Post road addressing guidelines (e.g., "26540" in the above example is the pre-road number).
28	Mailing Address Road Type	Varchar(20)	**Conditional field -** Must be populated if it exists in the customer's mailing address. Road type in the Canada Post Addressing Guidelines e.g., Township Road = "TWP RD", Highway = "HWY", Range Road = "Range RD" ("Range RD" in the above example is the road type).
29	Mailing Address Post-Road Number	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number of the road that appears after the road type in the Canada Post road addressing guidelines ("11" in the above example is the road number).
30	Mailing Address Compartment	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number of the compartment to follow "COMP" in Canada Post Addressing Guidelines mailing address e.g., "COMP 10 SITE 4 RR 3."
31	Mailing Address Site Number	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number of the site to follow "SITE" in Canada Post Addressing Guidelines rural mailing address, e.g., "COMP 10 SITE 4 RR 3."
32	Mailing Address Rural Route	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number of the rural route to follow "RR" in Canada Post Addressing Guidelines rural mailing address, e.g., "COMP 10 SITE 4 RR 3."
33	Mailing Address Mobile Route	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number of the mobile route to follow "MR" in Canada Post Addressing Guidelines mailing address, e.g., "COMP 10 SITE 4 MR 3."
34	Mailing Address Suburban Service	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number of the suburban service to follow "SS" in Canada Post Addressing Guidelines mailing address, e.g., "COMP 10 SITE 4 SS 3."

Sequence	Field	Data type/size	Description
35	Mailing Address Station Name	Varchar(50)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Name to follow "STN" in Canada Post Addressing Guidelines mailing address, e.g., "PO BOX 11223 STN MAIN Toronto ON."
36	Mailing Address Retail Postal Outlet	Varchar(50)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Name of the retail postal outlet to follow "RPO" in Canada Post Addressing Guidelines mailing address, e.g., "PO BOX 123 RPO Standard Life Edmonton AB."
37	Mailing Address Post Office Box	Varchar(10)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Number to follow "PO BOX" in Canada Post Addressing Guidelines mailing address, e.g. "PO BOX 11223 STN MAIN Toronto ON."
38	Mailing Address Letter Carrier Depot	Varchar(50)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Name of the letter carrier depot to follow "LCD" in Canada Post Addressing Guidelines mailing address, e.g., "PO BOX 1352 LCD Blue Quill Edmonton AB"
39	Mailing Address City	Varchar(50)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Name of the town or city.
40	Mailing Address Province / State Code	Char(2)	**Conditional field** - Must be populated if it exists in the customer's mailing address. Use standard two-character codes.
41	Mailing Address Postal Code/Zip Code	Varchar(9)	**Conditional field** – Must be populated if it exists in the customer's mailing address. Postal or zip code – nine characters allows for the largest possible zip code.
42	Mailing Address Country	Varchar(30)	**Conditional field** – Must be populated if it exists in the customer's mailing address and the mailing address is in the United States. Full country name in mailing address.
43	Foreign Mailing Address	Varchar(500)	**Conditional field** - Required if the customer's mailing address is outside Canada or United States.
44	Critical To Have Power Flag	Char(1)	**Optional field** - Populated at sender's discretion (with appropriate medical supporting documentation on record). "Y" if it is critical for this customer to have power due to human medical needs. "N" or [null] if not. (In order for the distributor to de-energize this site, this field must have a value of "N" or [null]).
45	Critical To Have Power Reason	Varchar(30)	**Conditional field** - Required if Critical To Have Power Flag = "Y"; otherwise [null]. Medical reason it is critical for this customer to have power.
46	Site Contact Last Name	Varchar(100)	**Conditional field** - Required if it exists in the retailer's record of the customer's information. Site contact is intended to mean the individual responsible for day-to-day functions at a site.
47	Site Contact First Name	Varchar(100)	**Conditional field** - Required if it exists in the retailer's record of the customer's information. Site contact is intended to mean the individual responsible for day-to-day functions at a site.

Sequence	Field	Data type/size	Description
48	Site Contact Phone Number	Telephone Number Format	**Conditional field** - Required if it exists in the retailer's record of the customer's information. If the customer's site contact phone number is not different from the customer's phone number, then the number from the "Customer Phone Number" field should be repeated. Site contact is intended to mean the individual responsible for day-to-day functions at a site. A telephone number in Canada or the United States. See Section 9.4.6.2 for example.
49	Site Contact Email Address	Varchar(320)	**Conditional field** – Required if it exists in the retailer's record of the customer's information. If the customer's site contact email address is not different from the customer's email address, then the email address from the "Customer Email Address" field should be repeated. Site contact is intended to mean the individual responsible for day-to-day functions at a site.
50	Site Contact Alternate Last Name	Varchar(100)	**Conditional field** – Required if it exists in the retailer's record of the customer's information. Last name of an alternate site contact.
51	Site Contact Alternate First Name	Varchar(100)	**Conditional field** – Required if it exists in the retailer's record of the customer's information. First name of an alternate site contact.
52	Site Contact Alternate Phone Number	Telephone Number Format	**Conditional field** – Must be populated if it exists in the retailer's record of the customer's information and is a telephone number in Canada or the United States. See Section 9.4.6.2 for example.
53	Site Contact Alternate Email Address	Varchar(320)	**Conditional field** – Must be populated if it exists in the retailer's record of the customer's information.
54	Transaction Status Code	Char(4)	**Conditional field** – If the transaction is being sent by the retailer, this field is [null]; otherwise this field is mandatory when the WSP is sending the transaction to notify the retailer of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.4.2 Request update to customer information transaction (RUC) – information requirements

(1) This transaction may be sent by a WSP if the WSP suspects that the customer information for a specific site is not up to date and is requesting the retailer send a UCI.

(2) The WSP must specify which site IDs require the new UCI. The retailer must respond within five business days of receiving the request by providing a new UCI or by contacting the WSP by email to advise that no new information is available.

(3) Each WSP can send a maximum of 25 different RUCs per retailer each week.

Table 23. Request update to customer information transaction (RUC)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"RUC"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A- 3.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	Site ID	Site ID format	**Mandatory field** – Site for which the UCI is required. Unique identifier representing a site. See Section 9.4.6.12.

Sequence	Field	Data type/size	Description
6	First Incorrect Field	Number(3)	**Mandatory field –** Field containing incorrect information from a UCI currently held by the WSP.
7	Second Incorrect Field	Number(3)	**Optional field** - Populated at sender's discretion. Field containing incorrect information from a UCI currently held by the WSP.
8	Third Incorrect Field	Number(3)	**Optional field** - Populated at sender's discretion. Field containing incorrect information from a UCI currently held by the WSP.
9	Fourth Incorrect Field	Number(3)	**Optional field** - Populated at sender's discretion. Field containing incorrect information from a UCI currently held by the WSP.
10	Fifth Incorrect Field	Number(3)	**Optional field** - Populated at sender's discretion. Field containing incorrect information from a UCI currently held by the WSP.
11	Transaction Status Code	Char(4)	**Conditional field** – If the transaction is being sent by the WSP, this field is [null]; otherwise this field is mandatory when a retailer is sending the transaction to notify the WSP of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.5 Update site information transaction set

9.6.5.1 Site metering characteristics transaction (SMC) – information requirements

(1) The SMC consists of site and metering information. The WSP sends the SMC to the retailer of record applicable on the effective date of the change to communicate the following changes:

(a) There has been a successful enrolment.

(b) The energized state has been changed, or a load limiter has been installed or removed (see Sequence 7).

(c) The metering configuration has changed. This includes a change to:

(i) type of metering (interval, cumulative or unmetered) (see Sequence 6)

(ii) subtract metering (see Sequence 8)

(iii) loss compensation (see Sequence 9)

(2) When a change as described in Section 9.6.5.1(1) occurs, and the change continues past midnight, the purpose of the SMC is to report the characteristics as they exist as of the end of the day on which they change. No more than one SMC per site per effective date shall be sent each day.

(3) If an SMC was sent with incorrect information in any of sequences 6, 7, 8, 9 or 11, new SMCs will be sent to replace the SMC that contained the error and all subsequent SMCs. The Effective Date Time field in the corrected SMC will be populated with the actual date of the error. However, if the error occurred more than eight years ago, the WSP has the option of using the actual date of the error in the SMC or a deemed date eight years ago.

(4) If an SMC was not sent as required under Section 9.6.5.1(1), the missing SMC will be sent and all subsequent SMCs will be replaced with new SMCs. The Effective Date Time field in the missing SMC will be populated with the actual date the change took effect. However, if the change took effect more than eight years ago, the WSP has the option of using the actual date of the error in the SMC or a deemed date eight years ago.

(5) Changes to meter number, multiplier or last reading will be reported by way of the DCM.

Table 24. Site metering characteristics transaction (SMC)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"SMC"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A-3.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
6	Type of Metering	Char(1)	**Mandatory field** – The type of metering at the site. Values are: "C" – Cumulative "I" – Interval "U" – Unmetered
7	Energized Indicator	Char(1)	**Mandatory field** – Indicates the energization status of the site at the time of the effective date. Values are: "Y" – Energized "N" – De-energized "L" – Load limiter installed See sections 7.7, 7.8 and 7.9.
8	Subtract Metering	Char(1)	**Mandatory field** – Indicates whether the site is subtract metered. Values are: "Y" – Yes "N" – No Must be "Y" if the site is metered in such a way that an additional correcting DCM usage value will be provided.
9	Loss Compensation	Char(1)	**Mandatory field** – Indicates whether the site is loss compensated. Values are: "Y" – Yes "N" – No Must be "Y" if the site meter reading requires an additional correcting DCM usage value.
10	Socket ID	Socket ID format	**Optional field** - Populated at sender's discretion. See Section 9.4.6.13.
11	Effective Date Time	Date time format	**Mandatory field** – Effective date and time of a change as described in Section 9.6.5.1(1)(a), (b) or (c).
12	Meter Number for kWh	Varchar(20)	**Conditional field** – If Type of Metering = "C," this field is mandatory; otherwise this field is [null].
13	Billing Multiplier for kWh	Number(14,9)	**Conditional field** – If Type of Metering = "C," this field is mandatory; otherwise this field is [null].
14	Number of Dials	Number(3)	**Conditional field** – If Type of Metering = "C," this field is mandatory; otherwise this field is [null].
15	Decimal Positions	Number(1)	**Conditional field** – If Type of Metering = "C," this field is mandatory; otherwise this field is [null].
16	Last Reading Date Time	Date time format	**Conditional field** – If Type of Metering = "C," this field is mandatory; otherwise this field is [null].
17	Last Meter Dial Reading	Number(10)	**Conditional field** – If Type of Metering = "C," this field is mandatory; otherwise this field is [null].
18	Meter Number for kVa	Varchar(20)	**Conditional field** – If Type of Metering = "C" and the cumulative meter has a KVA or VA register, this field is mandatory; otherwise this field is [null].
19	Billing Multiplier for kVa	Number(14,9)	**Conditional field** – If Type of Metering = "C" and the cumulative meter has a KVA or VA register, this field is mandatory; otherwise this field is [null]. Note: Includes meter multiplier and all external equipment, and also includes .001 factor if required to get from VA reading to KVA demand.
20	Meter Number for kW	Varchar(20)	**Conditional field** – If Type of Metering = "C" and the cumulative meter has a kW or WATT register, this field is mandatory; otherwise this field is [null].

Sequence	Field	Data type/size	Description
21	Billing Multiplier for kW	Number(14,9)	**Conditional field** – If Type of Metering = "C" and the cumulative meter has a kW or WATT register, this field is mandatory; otherwise this field is [null]. Note: Includes meter multiplier and all external equipment, and also includes .001 factor if required to get from WATT reading to kW demand.
22	Transaction Status Code	Char(4)	**Conditional field** - If the transaction is being sent by the WSP, this field is [null]; otherwise this field is mandatory when a retailer is sending the transaction to notify the WSP of problems with the transaction. Applicable transaction status codes in Appendix A, Table A-8 must be used.

9.6.6 Post-final adjustment mechanism (PFAM) transaction set

9.6.6.1 Retailer specific adjustment transaction (RSA) – information requirements

(1) The total energy identified in MWh may be either positive or negative. A positive number means the retailer pays the ISO and a negative number means that the ISO pays the retailer.

Table 25. Retailer specific adjustment transaction (RSA)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"RSA"	**Mandatory field** – Abbreviation for the transaction.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender. See Appendix A, Table A-4.
4	PFAM Reference #	Number(10)	**Mandatory field** – Unique identifier representing the PFAM adjustment.
5	Retailer ID	Retailer ID format	**Mandatory field** – Recipient (retailer of record associated with the site for period under dispute).
6	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
7	Settlement Interval Ending Time	Date time format	**Mandatory field** – Date and time of the interval the data is for.
8	Interval Period	Number(4)	**Mandatory field** – Number of minutes in the interval period. "60" is the current standard.
9	Settlement Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described in Section 9.4.6.3(2)(b).
10	Consumption (kWh)	Number(12,4)	**Mandatory field** – Adjustment to consumption for PFAM adjustment.
11	UFE (kWh)	Number(12,4)	**Mandatory field** – Adjustment to UFE for PFAM adjustment.
12	Loss (kWh)	Number(12,4)	**Mandatory field** – Adjustment to losses for PFAM adjustment.
13	Total Energy (MWh)	Number(12,7)	**Mandatory field** – Total of the consumption, line loss and UFE for the PFAM in MWh for the ISO.
14	Financial Eligibility Indicator	Char(1)	**Mandatory field** – "Y" – Eligible for financial adjustment "N" – Not eligible for financial adjustment (information only)
15	PFAM Adjustment Reason Code	Number(4)	**Mandatory field** – Reason for the PFAM adjustment. See Appendix A, Table A-15 for list of PFAM reason codes.
16	Zone ID	Zone ID format	**Conditional field** – If the LSA runs settlement in more than one settlement zone, this field is mandatory. Settlement zone ID where PFAM adjustment is applicable. See Appendix A, Table A-6.

9.6.6.2 Retailer adjustment to market transaction (RAM) – content

Table 26. Retailer adjustment to market transaction (RAM)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"RAM"	**Mandatory field** – Abbreviation for the transaction.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender. See Appendix A, Table A-4.
4	Settlement Month	Number(6)	**Mandatory field** – Four-digit year and two-digit month of the settlement data being used for determining retailer allocation.
5	Settlement Type	Char(1)	**Mandatory field** – "F" for final settlement.
6	Retailer ID	Retailer ID format	**Mandatory field** – Retailer identification for the ISO billing purposes.
7	Retailer Energy Grand Total (MWh)	Number(17,7)	**Mandatory field** – Total of the consumption, line loss and UFE, less direct-connect sites for all the retailer's customers in the month.
8	Zone ID	Zone ID format	**Conditional field** – If LSA runs settlement in more than one settlement zone, this field is mandatory. Settlement zone ID where PFAM adjustment is applicable. See Appendix A, Table A-6.

9.6.6.3 Transmission administrator adjustment transaction (TAA) – information requirements

This transaction is required by the ISO and should be submitted when system-level measurement data has been found to be in error.

Table 27. Transmission administrator adjustment transaction (TAA)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"TAA"	**Mandatory field** – Abbreviation for the transaction.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	LSA ID	LSA ID format	**Mandatory field** – Sender. See Appendix A, Table A-4.
4	PFAM Reference #	Number(10)	**Mandatory field** – Unique reference number for the PFAM adjustment.
5	Retailer ID	Retailer ID format	**Mandatory field** – Retailer ID must be "872841374," which is the ISO retailer ID**.**
6	Site ID	Number(13)	**Mandatory field** – Must be "0" or "0000000000000" (since the adjustment is not on a site level).
7	Settlement Interval Ending Time	Date time format	**Mandatory field** – Date and time of the interval the data is for.
8	Interval Period	Number(4)	**Mandatory field** – Number of minutes in the interval period. "60" is the current standard.
9	Settlement Hour Ending	Varchar(3)	**Mandatory field** – Two digits representing the ending hour of the interval period. The third character is only for an asterisk as described in Section 9.4.6.3(2)(b).
10	Consumption (kWh)	Number(12,4)	**Mandatory field** – Adjustment to consumption for PFAM adjustment.
11	UFE (kWh)	Number(12,4)	**Optional field** - Populated at sender's discretion.
12	Loss (kWh)	Number(12,4)	**Optional field** - Populated at sender's discretion.
13	Total Energy (MWh)	Number(12,7)	**Mandatory field** – Total of the consumption, line loss and UFE for the PFAM adjustment in MWh.

Sequence	Field	Data type/size	Description
14	Zone ID	Zone ID format	**Conditional field** – If LSA runs settlement in more than one settlement zone, this field is mandatory. Settlement zone ID where PFAM adjustment is applicable. See Appendix A, Table A-6.

(1) Details of the TAA file shall be submitted by the LSA to the ISO on a monthly basis. The ISO will then make the necessary adjustments in billings between the transmission line losses account and all retailers within the affected zone. The adjustments may be either positive or negative, depending on whether the POD is overstated or understated.

(2) The following example details the adjustment sign in these two situations:

Example of the signed value in the TAA

Problem: when POD is	Data before correction	Data after correction	Energy sign in the TAA file	TAA line losses account	Retailers
Overstated	100	85	+15	Charge 15 to the TAA line losses account	Credit 15 to all retailers
Understated	100	120	-20	Credit 20 to the TAA line losses account	Charge 20 to all retailers

In terms of the TAA file format, it is necessary for the LSA to populate all the fields in accordance with Section 9.6.6.3. In particular, there are two fields that must be populated as follows in order for the ISO to process the file:

Field 5, Retailer ID must be "872841374" which is the ISO retailer ID.

Field 6, site ID must be "0" or "0000000000000" since the adjustment is not on a site level.

9.6.6.4 Micro-generation retailer summary transaction (GRS) – information requirements

This transaction is used by retailers to submit a generation credit summary report for each small micro-generator's site to the ISO on a monthly basis.

(1) Retailers are responsible for balancing site-level generation reported in the GRS to match the GCM for each period ensuring the generation credit is not over or under-allocated in their submission to the ISO. GRS are treated cumulatively meaning multiple submissions for the same site and period are added together.

(2) Retailers must submit GRS transactions to the ISO each month for all eligible small micro-generator sites enrolled with the retailer in that month.

(3) Only transactions that fail validation are rejected, not the entire file. The ISO will notify the sender of problems on a per transaction basis as soon as practical. The ISO will list the file name and the Total field on the retailer's pool statement.

(4) GRS data corrections for prior periods require a cancel and restatement of credit.

(a) A cancel transaction is indicated by negative values in the kWh and Total fields.

(i) All cancellation GRS fields should match exactly to the GRS to be cancelled except for the following fields:

(A) Transaction Date Time
(B) kWh should be negative value of original
(C) Total Amount should be negative value of original

(ii) If the original GRS kWh and Total amount is zero no cancellation is required.

(5) Where a meter read period spans the calendar month, the retailer must pro-rate the energy volume based on number of days within the billing month period and only submit for the days that it is the retailer of record.

Table 28. Micro-generation retailer summary transaction (GRS)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"GRS"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	ISO Financial ID	ISO financial ID format	**Mandatory field** – Recipient.
5	Site ID	Site ID format	**Mandatory field** – Unique identifier representing a site. See Section 9.4.6.12.
6	From	Date format	**Mandatory field** – The date of the first day in the period over which the energy in the kWh field was supplied out of the site.
7	To	Date format	**Mandatory field** – The date of the last day in the period over which the energy in the kWh field was supplied out of the site.
8	kWh	Number(8,2)	**Mandatory field** – Kilowatt hour energy supplied out of the site between and including the From and To dates. Signed values allowed.
9	Rate	Number(8,5)	**Mandatory field** – The rate the retailer charged the micro-generator for electric energy supplied to the micro-generation site for the month as described in the *Micro-Generation Regulation*.
10	Total	Number(8,2)	**Mandatory field** – Total credit for the site in dollars (kWh x rate) rounded to two decimal places. Signed values allowed.

9.6.7 Energize/de-energize site

(1) The energize request transaction (ENR) and the de-energize request transaction (DER) are initiated by either the customer or the retailer to request energization or de-energization of a site. Whether initiated by the customer or the retailer, the retailer sends the transactions to the WSP to request the work to be completed. If the retailer is requesting energization of a site, the retailer sends an energize request transaction (ENR) to the WSP. If the retailer is requesting de-energization of a site, the retailer sends a de-energize request transaction (DER) to the WSP.

(2) In response to the transactions, the WSP either completes the work and sends a completion transaction, or fails back the transaction with a failure transaction. If a retailer switch as described in Section 7.4 occurs in between the requesting transaction (i.e. ENR or DER) and the completion of the work, the WSP shall do the following:

(a) If the requesting transaction is an ENR, the WSP shall continue to proceed with completion of the energization and send an energize completion transaction to the requesting retailer.

(b) If the requesting transaction is a DER, the WSP shall cancel the request, fail the order by sending a de-energize failure transaction (DEF) to the requesting retailer and populate the De-energize Failure Reason Code field with "0008" (invalid retailer ID for site).

(3) The WSP shall send the completion notification transactions (ENCs, ENFs, DECs and DEFs) resulting from energize and de-energize request transactions a minimum of once per hour between 6 a.m. and 7 p.m. and at least once between 7 p.m. and 6 a.m. each day.

(a) An exception to the performance standard stated in Section 9.6.7(3) above shall be permitted for scheduled maintenance or for other reasons that are specifically approved by the AUC, not to exceed five non-consecutive calendar days per calendar month.

9.6.7.1 Energize request transaction (ENR) – information requirements

(1) Responsibility for load as a result of emergency energization

(a) An emergency energization is a condition where energization may occur on the day immediately preceding the enrolment effective date. This is only allowed when a customer has failed to make necessary arrangements prior to moving into a residence and the customer is switching to a retailer other than the current retailer of record.

(b) In such circumstances, the retailer of record on the day of energization will be allocated the load for that day and only that day.

(c) Emergency energization prior to enrolment is limited to residential and farm customers.

(d) This clause does not obligate a WSP to perform emergency energizations prior to enrolment.

Table 29. Energize request transaction (ENR)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"ENR"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	Business Function ID	Varchar(2)	**Mandatory field** - See Appendix A, Table A-2.
5	WSP ID	WSP ID format	**Mandatory field** – Recipient - WSP for the site. See Appendix A, Table A-3.
6	Site ID	Site ID format	**Mandatory field** – Site to energize. Unique identifier representing a site. See Section 9.4.6.12.
7	Priority Code	Number(1)	**Mandatory field** – Standard priority code representing the energize request urgency. See Appendix A, Table A-10 for list of priority codes (electric distributors only).
8	Requested Energize Date	Date format	**Optional field** - Populated at sender's discretion. Date the power is to be turned on. Distributors are not obligated to meet request dates.
9	Contact Name	Varchar(100)	**Mandatory field** – Contact name of person for access to the site. The person to contact in the event of problems executing this request.
10	Contact Phone Number	Telephone Number Format	**Mandatory field** – The phone number of the contact person named in the transaction for access to the site.
11	Message to WSP	Varchar(160)	**Optional field** - Information to assist the WSP in executing this request.

9.6.7.2 Energize failure transaction (ENF) – content

Table 30. Energize failure transaction (ENF)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"ENF"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site See Appendix A, Table A-3

4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient
5	Site ID	Site ID format	**Mandatory field** – Site that could not be energized. Unique identifier representing a site. See Section 9.4.6.12
6	Energize Failure Reason Code	Char(4)	**Mandatory field** – Reason why the energize request failed. When using transaction status codes, the applicable ENF transaction status codes listed in Appendix A must be used.

9.6.7.3 Energize completion to retailers and LSA transaction (ENC) – content

Table 31. Energize completion to retailers and LSA transaction (ENC)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"ENC"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A-3.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	LSA ID	LSA ID format	**Mandatory field** – Recipient. See Appendix A, Table A-4.
6	Site ID	Site ID format	**Mandatory field** – Site that was energized. Unique identifier representing a site. See Section 9.4.6.12.
7	Energized Date and Time	Date time format	**Mandatory field** – Date the site was energized.

9.6.7.4 De-energize request transaction (DER) – content

Table 32. De-energize request transaction (DER)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DER"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	Business Function ID	Varchar(2)	**Mandatory field** See Appendix A, Table A-2.
5	WSP ID	WSP ID format	**Mandatory field** – Recipient - WSP for the site. See Appendix A, Table A-3.
6	Site ID	Site ID format	**Mandatory field** – Site to de-energize. Unique identifier representing a site. See Section 9.4.6.12.
7	Priority Code	Number(1)	**Optional field** - Populated at sender's discretion. Standard priority code representing the de-energize request urgency. See Appendix A, Table A-11 for list of priority codes.
8	Requested De-energize Date	Date format	**Mandatory field** – Date the power is to be disconnected.
9	Contact Name	Varchar(100)	**Mandatory field** – Contact name of person for access to the site. The person to contact in the event of problems executing this request.
10	Contact Phone Number	Telephone Number Format	**Mandatory field** – The phone number of the contact person named in the transaction. The telephone number of the person for access to the site.
11	De-energize Reason Code	Number(4)	**Mandatory field** - Reason for the De-energize. The values are: "0001" – Customer request "0002" – Cut off for nonpayment "0003" – Premises demolished "0004" – Safety shut off "0005" – Seasonal shut off "0006" – Vacant premises
12	Message to WSP	Varchar(160)	**Optional field** - Information to assist the WSP in executing this request.

9.6.7.5 De-energize failure transaction (DEF) – content

Table 33. De-energize failure transaction (DEF)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DEF"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A-3.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	Business Function ID	Varchar(2)	**Optional field** – See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Site that could not be de-energized. Unique identifier representing a site. See Section 9.4.6.12.
7	De-energize Failure Reason Code	Char(4)	**Mandatory field** – Reason why the de-energize request failed. When using transaction status codes, the applicable DEF transaction status codes listed in Appendix A must be used.
8	Other Failure Description	Varchar(80)	**Conditional field –** must be populated if it exists in the distributors system. Descriptive reason why the de-energize request failed, e.g. "Dog in yard," "Gate frozen," "Load limiter installed," etc.

9.6.7.6 De-energize completion to retailers and LSA transaction (DEC) – content

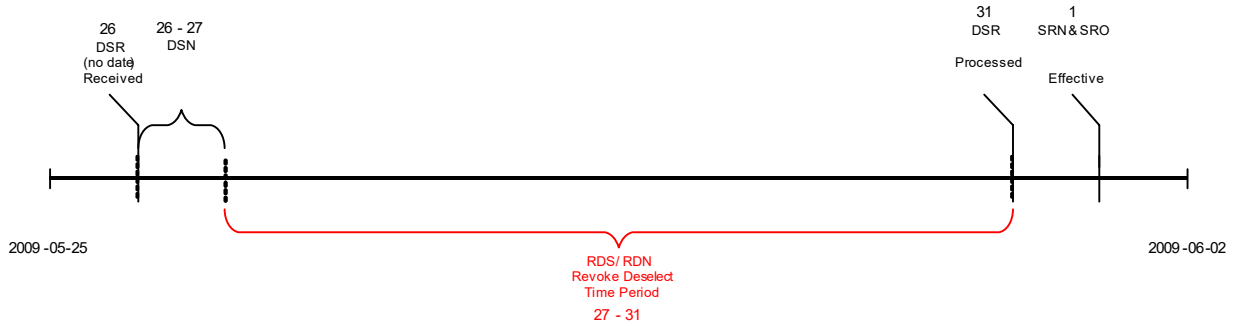
Table 34. De-energize completion to retailers and LSA transaction (DEC)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DEC"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A-3.
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	Business Function ID	Varchar(2)	**Optional field** – See Appendix A, Table A-2.
6	Site ID	Site ID format	**Mandatory field** – Site that was de-energized. Unique identifier representing a site. See Section 9.4.6.12.
7	De-energized Date and Time	Date time format	**Mandatory field** – Date the site was de-energized.

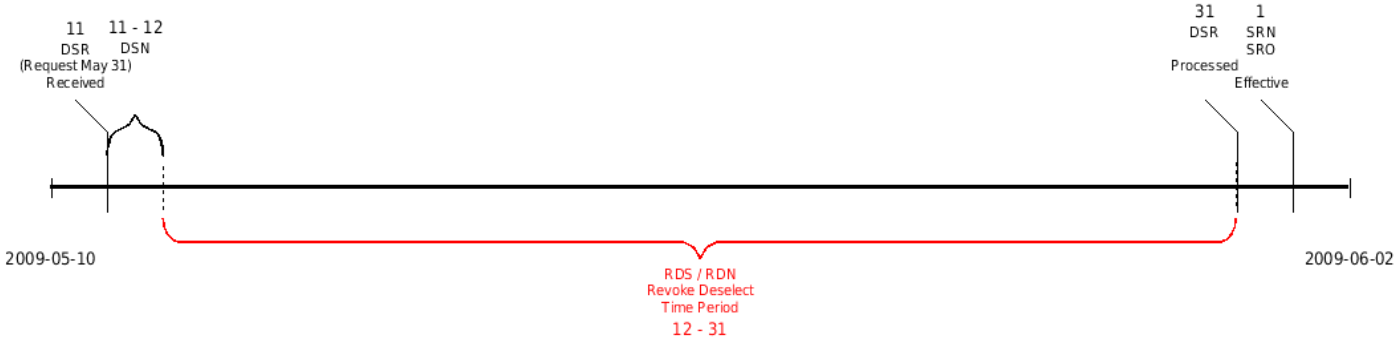
9.6.8 De-select retailer transaction set

Figure 2. Timelines for de-select retailer transaction set

DSR with no request date that is sent and received on May 26:



DSR with request date May 31 that is sent and received on May 11:



9.6.8.1 De-select request transaction (DSR) – information requirements

(1) The DSR enables a retailer to notify a WSP that they will no longer provide electricity services for the site.

(2) The DSR will be processed effective on the date in the Requested De-select Date field of the DSR unless the site is enrolled earlier by another retailer or the current retailer revokes the de-select request before the site is switched to the regulated rate provider or the default supplier.

(3) The site will be switched to the regulated rate provider or the default supplier upon the expiry of the date (i.e., 23:59:59) in the Requested De-select Date field in the DSR or the deemed date if the de-select date is [null] i.e., enrolment requests from the regulated rate provider or the default supplier are deemed to have been received at the expiry of the date.

(4) The WSP will accept a DSR and the requested de-select date will be deemed to be five calendar days from the day the DSR was received if the Requested De-select Date field is [null].

(5) The WSP will accept a DSR and default the date to five calendar days from the transaction receipt where the date in the Requested De-select Date field in the DSR is less than five days from the date the DSR is received by the WSP.

(6) The date in the Requested De-select Date field (if populated) must be no greater than 60 calendar days from the date the DSR is received by the WSP.

(7) The retailer must include a de-select reason code in the De-select Reason Codes field of the DSR.

(8) The De-select Reason Code field shall be populated with “0001” only in situations where there was not an erroneous enrolment (as defined in Section 7.4(6)) and the customer consuming electricity at the site has physically moved or will be physically moving to another site.

(9) The De-select Reason Code field shall be populated with “0002” only in situations where there was not an erroneous enrolment (as defined in Section 7.4(6)) and the retailer no longer wishes to have the customer enrolled or a customer no longer wishes to be served by the retailer. When sending a DSR containing “0002” in the De-select Reason Code field, the retailer must send an UCI transaction (as per the UCI Section 9.6.4). The WSP must transfer the UCI customer information to the regulated rate provider or the default supplier for the site. The WSP may reject a de-enrolment if an UCI is not received. A de-enrolment may not be rejected on the basis of a failed UCI. The WSP’s validation process for de-enrolment may only include that a populated UCI was received. If the UCI in question is rejected by the WSP, the retailer must send a corrected UCI within one business day.

(10) The De-select Reason Code field shall be populated with "0003" only in situations where there was an erroneous enrolment (as defined in Section 7.4(6)). When receiving a DSR containing "0003" in the De-select Reason Code field, the WSP shall notify the LSA and the LSA shall perform the actions in accordance with Section 7.4(6).

(11) The De-select Reason Code field must be populated with "0004" only in situations where there is an abandoned oil and gas well site or lighting site affiliated with the oil and gas site enrolment (as defined in Section 7.4(8)) located on rural land. When receiving a DSR containing "0004" in the De-select Reason Code field, the WSP must send a copy of the DSR with reason code of "0004" to inform the regulated rate provider.

Table 35. De-select request transaction (DSR)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DSR"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	WSP ID	WSP ID format	**Mandatory field** – Recipient - WSP for the site. See Appendix A, Table A-3.
5	Site ID	Site ID format	**Mandatory field** – Site to de-select. Unique identifier representing a site. See Section 9.4.6.12.
6	Requested De-select Date	Date format	**Optional field** – Date the site is to be de-selected.
7	De-select Reason Codes	Varchar(4)	**Mandatory field** – Reason for the de-select request. Values are: "0001" – Customer moving out (as per Section 9.6.8.1(8)) "0002" – Retailer drops customer (as per Section 9.6.8.1(9)) "0003" – Erroneous enrolment (as per Section 9.6.8.1(10)) "0004" – Abandoned oil and gas well sites (as per Section 9.6.8.1(11))

9.6.8.2 De-select notification transaction (DSN) – information requirements

The WSP will send a DSN of acceptance or rejection of the DSR that the WSP received.

Table 36. De-select notification transaction (DSN)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"DSN"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site See Appendix A, Table A-3
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient
5	MDM ID	MDM ID format	**Mandatory field** – Recipient (MDM responsible for reading the meter) See Appendix A, Table A-5
6	LSA ID	LSA ID format	**Mandatory field** – Recipient. See Appendix A, Table A-4.
7	Site ID	Site ID format	**Mandatory field** – Site being de-selected. Unique identifier representing a site. See Section 9.4.6.12.
8	De-select Notification Code	Varchar(4)	**Mandatory field** – Reason the DSR was confirmed or rejected. When using transaction status codes, the applicable DSN transaction status codes listed in Appendix A, Table A-8, must be used.

9.6.8.3 Revoke de-select request transaction (RDS) – information requirements

The WSP will accept an RDS from a retailer where the retailer is still the current retailer of record of the site and the current retailer has sent a confirmed DSR transaction.

Table 37. Revoke de-select request transaction (RDS)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"RDS"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	Business Function ID	Varchar(2)	**Optional field** – See Appendix A, Table A-2.
5	WSP ID	WSP ID format	**Mandatory field** – Recipient - WSP for the site See Appendix A, Table A-3.
6	Site ID	Site ID format	**Mandatory field** – Site the RDS applies to. Unique identifier representing a site. See Section 9.4.6.12.

9.6.8.4 Revoke de-select notification transaction (RDN) – information requirements

The WSP will send a RDN of acceptance or rejection for each RDS transaction that the WSP received.

Table 38. Revoke de-select notification transaction (RDN)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"RDN"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A-3
4	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
5	Business Function ID	Varchar(2)	**Optional field** – See Appendix A, Table A-2.
6	MDM ID	MDM ID format	**Mandatory field** – Recipient (MDM responsible for reading the meter). See Appendix A, Table A-5.
7	LSA ID	LSA ID format	**Mandatory field** – Recipient. See Appendix A, Table A-4.
8	Site ID	Site ID format	**Mandatory field** – Site being de-selected. Unique identifier representing a site. See Section 9.4.6.12.
9	De-select Notification Code	Varchar(4)	**Mandatory field** – Reason the RDS was confirmed or rejected. When using transaction status codes, the applicable RDN transaction status codes listed in Appendix A, Table A-8, must be used.

9.6.9 Request off-cycle meter read transaction set

(1) If a customer or retailer requires a meter read off cycle, the retailer sends the request off-cycle meter read transaction (ROR) to the WSP who then notifies the MDM to obtain the read.

(2) If the MDM obtains the read, the MDM provides a DCM to the WSP, the LSA and the retailer. If the site is a micro-generation site, the MDM also provides a GCM to the WSP, the LSA and the retailer. The WSP provides a request off-cycle meter read completion

transaction (ROC) to the retailer and populates the Completion Flag field with "Y" (off-cycle reading obtained).

(3) If the MDM cannot obtain the read, the WSP issues an ROC to the retailer and populates the Completion Flag field with "N" (off-cycle reading not obtained).

(4) If a retailer switch as described in Section 7.4 occurs after the retailer sends the ROR but before the MDM obtains the read, the WSP shall not cancel the read request. When the read is obtained by the MDM, the WSP shall send the ROC to the retailer that sent the ROR and shall populate the Off-Cycle Read Date field with the date the read was obtained.

9.6.9.1 Request off-cycle meter read transaction (ROR) – content

Table 39. Request off-cycle meter read transaction (ROR)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"ROR"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	Business Function ID	Varchar(2)	**Mandatory field** – See Appendix A, Table A-2.
5	WSP ID	WSP ID format	**Mandatory field** – Recipient - WSP for the site. See Appendix A, Table A-3.
6	Site ID	Site ID format	**Mandatory field** – Site the retailer is requesting the off-cycle read be taken on. Unique identifier representing a site. See Section 9.4.6.12.
7	Priority Code	Number(1)	**Optional field** - Populated at sender's discretion. Standard priority code representing the ROR urgency. See Appendix A, Table A-12 for list of priority codes.
8	Requested Off-cycle Read Date	Date format	**Mandatory field** – Date the meter is requested to be read.
9	Meter Access Instructions	Varchar(80)	**Optional field** – Instructions on how to access the meter, or warnings (e.g. "Dog," "See manager," etc.)

9.6.9.2 Request off-cycle meter read completion transaction (ROC) – content

Table 40. Request off-cycle meter read completion transaction (ROC)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"ROC"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Recipient.
4	WSP ID	WSP ID format	**Mandatory field** – Sender - WSP for the site. See Appendix A, Table A-3.
5	Site ID	Site ID format	**Mandatory field** – Site the ROR was requested for. Unique identifier representing a site. See Section 9.4.6.12.
6	Completion Flag	Char(1)	**Mandatory field** – Indicates whether the off-cycle reading was obtained. Values are: "Y" – Off-cycle reading obtained "N" – Off-cycle reading was not obtained
7	Off-cycle Incomplete Reason	Varchar(80)	**Conditional field –** If Completion Flag = "N," this field is mandatory; otherwise this field is [null].

Sequence	Field	Data type/size	Description
8	Off-cycle Read Date	Date time format	**Conditional field –** If Completion Flag = "Y," this field is mandatory and shall be populated with the date the meter is read; otherwise this field is [null].

9.7 Transaction with standard content

The following transaction does not require electronic transmittal.

9.7.1.1 Revoke de-energize request transaction (RDR) – information requirements

This transaction is a request and has no performance or time certainty. The WSP may not be capable of recalling or cancelling the de-energization of the site.

Table 41. Revoke de-energize request transaction (RDR)

Sequence	Field	Data type/size	Description
1	Transaction Abbreviation	"RDR"	**Mandatory field** – Abbreviation of the transaction name.
2	Transaction Date Time	Date time format	**Mandatory field** – Later of the time the transaction was created or last modified.
3	Retailer ID	Retailer ID format	**Mandatory field** – Sender.
4	Business Function ID	Varchar(2)	**Mandatory field** – See Appendix A, Table A-2.
5	WSP ID	WSP ID format	**Mandatory field** – Recipient - WSP for the site. See Appendix A, Table A-3.
6	Site ID	Site ID format	**Mandatory field** – Site the RDR applies to. Unique identifier representing a site. See Section 9.4.6.12.

9.8 Transaction status codes

After a WSP receives a transaction, the WSP may screen the transaction for errors in the content or format of the transaction itself and/or for inconsistencies with other WSP data sources. The types and levels of detail of the error screening is up to each WSP. The notification to the sender of the error status of the transaction should use whichever of the status codes in Table A-8: Transaction status codes in Appendix A are appropriate for the error screening performed by the WSP.

10 Performance standards for meter data managers operating in the province of Alberta

10.1 Roles and responsibilities

(1) The MDM is the entity responsible for collecting metering data, validating and correcting interval metering data, storing historical data, and reporting data to required parties.

(2) Accountability for accuracy of metering data, shall be the responsibility of one and only one entity. Accountabilities are as follows:

(a) The owner of a transmission facility, an electric distribution system or a generating unit as defined by the *Electric Utilities Act* is responsible for providing metering and all related metering services, including the function of MDM for meters that are directly connected to the owner's transmission facility, electric distribution system or generating unit.

(b) The owner of a transmission facility, an electric distribution system or a generating unit may make arrangements under which other parties perform any or all of the functions of the MDM if the arrangements do not diminish or remove the responsibility or liability of the owner for carrying out those functions.

10.2 Interval meter data performance standards

(1) Interval meters and related recording devices are used to collect metering data at fixed intervals. The three main functional areas are described as system-level, site-level and private meters.

(2) System interval meters gather system-level interval data and the metering data represented in the DSM transaction are used for load settlement.

(3) Site interval meters gather site-level interval data and the metering data represented in the DIM transaction are used for load settlement and retail billing.

(4) Measurement data from interval meters that do not impact the financial settlement are considered out of scope of this performance standard.

(5) This standard does not deal with non-interval meters that are used at the system level. In those situations, WSP's supply interval data derived from cumulative meters and/or an array of meters, local conditions, knowledgeable estimates and bilateral arrangements with other WSPs to reasonably and fairly represent interval data.

(6) All system-level interval metering points must be in compliance with the ISO Measurement System Standard for installation and testing purposes.

10.2.1 Data collection

MDMs are responsible for collecting system-level and site-level interval meter data as required to ensure that they can comply with the standards outlined in Section 10.2.4 and Section 10.2.5.

10.2.2 Validation, estimation and editing (VEE)

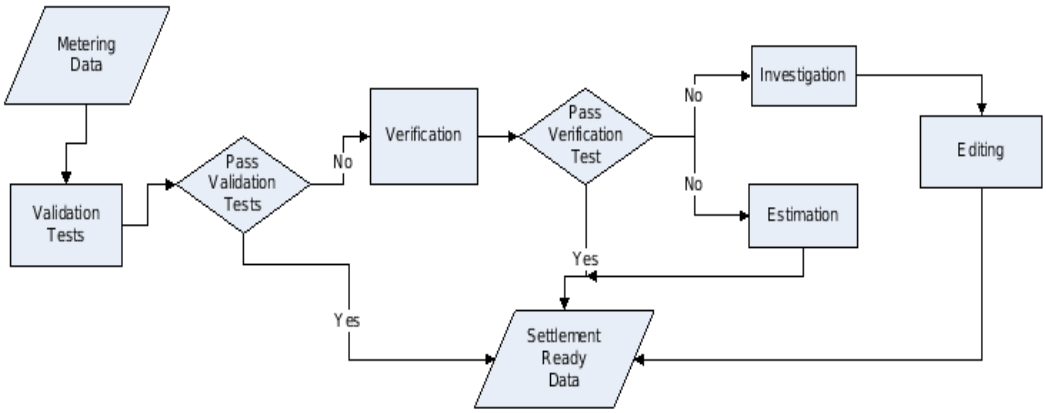
10.2.2.1 Process overview

(1) The MDMs shall employ the validation, estimation and editing steps as described in this section to create the load settlement ready data. MDMs shall maintain adequate records to explain all validation failures and revalidations.

(2) Validation, estimation and editing process.

MDM shall undertake the following steps in providing load settlement ready data for the market:

Figure 3. VEE overview



(a) MDM shall perform VEE of interval metering data at each contributing meter.

(b) MDM shall validate all interval metering data using the validation tests outlined in Section 10.2.2.2.

(c) If the data passes the validation tests, the data shall be considered load settlement-ready and shall be provided to the designated parties as per Section 10.2.4 and Section 10.2.5.

(d) The MDM will verify the data that failed validation test.

(e) If the MDM verifies that the failure of validation tests was applicable, then the MDM must:

(i) estimate the data as described in Section 10.2.2.4, and

(ii) provide corrected and finalized data to the LSA and ISO as per Section 10.2.2.6.

(f) Where an MDM is required to pass data to another MDM for purposes of creating measurement data the following apply:

(i) The originating MDM is responsible for conducting all VEE of the data.

(ii) If data timing requirements as specified in Section 10.2.4 and Section 10.2.5 for MDM to MDM data transfer are not met, the receiving MDM will estimate the data in accordance with Section 10.2.2.4.

10.2.2.2 Validation of data

MDMs shall conduct the procedures outlined below to validate the collected data.

Table 42. Interval metering validation procedures

Check	Test	Description	
Data completeness	• No interval gaps • No duplicate intervals • Energy and reactive power (e.g. kVARh) for all intervals	• Complete set of data per meter – this validation calculates the number of time intervals "Expected" between the start and stop time	
Acquisition system time check	• Compare acquisition system clock to National Research Council (NRC) atomic clock • +/- 1 minute, NRC atomic clock	• Time drift of meter reading device/system clock • Ensures that all parties have a common time of reference • Reset acquisition system clock if out	
Meter time check	• Compare meter clock to NRC atomic clock • +/- 1 minute, NRC	• Time drift of meter clock • Reset meter clock if out	
Pulse overflow check	• Improper scaling factor in meter • Improperly sized transformer hardware problem	• Metering data condition that occurs as the result of a pulse count reaching its maximum value, register overflow detected, or demand value exceeds maximum limit. All overflow checks listed are monitored/flagged within the meter itself. When available this metering data condition can be collected during the metering data retrieval process and stored as a channel status for review/reporting purposes. • Applies to recorders only and not to modern fully electronic metering systems.	

10.2.2.3 Verification of data

(1) If the MDM believes a failed validation test is not valid, the MDM has the opportunity to verify the validity of the validation test failure.

(2) If the MDM can determine with certainty that the failure is invalid, then the original metering data shall be considered load settlement ready.

(3) If the MDM is unable to determine with certainty that the failure is invalid, then the data shall be estimated using the standard outlined in Section 10.2.2.4.

(4) The verification step shall not impede the provision of load settlement-ready data as outlined in Section 10.2.4 and Section 10.2.5.

10.2.2.4 Estimation of data

When metering data fails one or more validation tests, estimated data shall be provided using one of the following methods in order of priority:

(1) Where redundant metering exists:

Where redundant metering exists, validated redundant metering shall replace failed metering data where:

(a) the redundant meter is approved for use by Industry Canada, and

(b) the metering data from both meters has historically been shown to be equal.

(2) Where check metering exists:

Validated check metering data shall replace failed metering data where the metering data from both sources has historically been shown to be comparable, adjusted by a site-specific mathematical scaling factor. The site-specific mathematical adjustment factor is calculated by dividing the check meter value by the reporting check value for the same interval date and time.

(3) Estimates of one hour or less:

Watt and VAR interval values shall be estimated using linear interpolation or proxy historical data (see Section 10.2.2.4(4) below). Intervals failing one or more validation rules cannot be used as start or end points for interpolation.

(4) Estimates greater than one hour:

(a) Watt and VAR interval values shall be estimated using proxy historical data for the same reporting meter provided that no load switching has occurred during the proxy historical period or during the period being estimated. Proxy historical data must be for the same intervals and must be valid and not estimated. A scaling factor may be applied to proxy data to improve estimate quality provided that the scaling methodology and relevant data is disclosed upon request (monthly, interim and final settlements only).

(b) Unless it can be shown that a more representative proxy day exists, the following shall be used:

(i) Previous week data for the same day of the week, as applicable.

(ii) Current month data for the same day(s) of the week, as applicable.

(iii) Previous month data for the same day(s) of the week, as applicable.

(iv) Current month of last year for the same day(s) of the week, as applicable.

(5) Estimates greater than one hour (no proxy day available):

If the above methods do not provide a reasonable estimate for circumstances such as significant load switching during the estimation period, watt and VAR interval values may be estimated using other methodologies provided that the methodology and relevant data is disclosed upon request (monthly, interim and final settlements only). Other methodologies may include:

(a) The use of supervisory control and data acquisition (SCADA) data (adjusted by a site-specific mathematical scaling factor if necessary to improve estimate quality).

(b) Performing load research analysis and/or conducting site-specific investigations.

(6) Estimation of data for large micro-generation

(a) Where no redundant metering or check metering exists, MDMs will initially estimate large micro-generation interval data at zero until successful conclusion of an investigation.

(b) MDMs may estimate large micro-generation based on relevant information, if it is available. Otherwise, large micro-generation will be reported as zero.

10.2.2.5 Investigation

If the meter or related devices are found to be suspect as a result of the data investigation, the MDM shall notify the meter owner within one business day.

10.2.2.6 Editing of data (data replacement)

Once the metering problem has been investigated and resolved, the MDM shall restate the data as follows:

(1) Original metering data is correct:

If the original metering data is found to be correct, the estimated data will be replaced by the original data and the original data shall be transmitted to the appropriate parties.

(2) Estimate revision:

If a more accurate estimate is established compared to a prior estimate, the MDM shall provide the appropriate parties with the revised estimated data.

(3) MDMs shall report all system-level data variances by way of the dispute process where such variance is not corrected in data used for daily, monthly, interim or final settlement data provision within one calendar month of the discovery of the variance.

10.2.3 Data storage

In addition to requirements outlined in the *Electricity and Gas Inspection Regulations*, MDMs shall:

(1) Store all original energy readings, substitutions, estimations and calculated values for real metering and measurement points, for a period of at least 24 months.

(2) Store all load settlement ready metering data for a period of at least 24 months.

10.2.4 System-level data provision

The MDM shall provide load settlement-ready data for system-level interval data in DSM records, according to the process rules as specified in Section 9.6.2.4.1.

Settlement data provision

(1) MDMs shall have provided to the ISO and the LSA a complete load settlement-ready data set for the day of the energy flow no later than the settlement timing provisions as specified in Section 4.3 of the code.

(2) MDMs who provide data to another MDM for aggregation of any kind shall deliver that data to the receiving MDM no later than 24 hours prior to the settlement timing provisions as specified in Section 4.3 of the code.

10.2.5 Site-level data provision

The MDM shall provide load settlement-ready data for site-level interval data in DIM records, according to the process rules as specified in Section 9.6.1.1.

Settlement data provision

(1) MDMs shall have provided to the LSA and the retailer a complete load settlement-ready data set for the day of the energy flow no later than the settlement timing provisions as specified in Section 4.3 of the code.

(2) MDMs who provide data to another MDM for aggregation of any kind shall deliver that data to the receiving MDM no later than 24 hours prior to the settlement timing provisions as specified in Section 4.3 of the code.

10.2.6 Data performance metrics

The following metrics are calculated and reported using DSM or DIM records as appropriate. If the standard is not met using these records, the underlying metering point data may be used to calculate the metrics to provide evidence of compliance to the ISO and the Commission. In this case, the energy reported is the sum of the absolute value of the net kWh for all intervals of metering points that contributed to the reported DSM or DIM interval data.

The MDM shall document the reasons for all instances where the performance metrics as described below are not met and provide such information to the ISO and the Commission with the metrics. These records shall be retained as described in Section 10.2.3.

10.2.6.1 System-level data performance metrics

(1) Daily data accuracy performance metric

The daily data stream is required to fall within two per cent accuracy where accuracy is calculated as follows:

$$\text{Accuracy} = \text{ABS}\left(\frac{\sum \text{ERD} - \sum \text{ERM}}{\sum \text{ERM}}\right) \times 100$$

where:

ERD (Energy Reported Daily) is the sum of the kWh of those intervals reported by the MDM in the daily streams for the calendar month no later than the daily settlement timing provisions as specified in Section 4.3.2(1), and

ERM (Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3(1).

(2) Monthly data accuracy performance metric

The monthly data stream is required to fall within two per cent accuracy, where accuracy is calculated as follows:

$$\text{Accuracy} = \text{ABS}\left(\frac{\sum ERM - \sum ERF}{\sum ERF}\right) \times 100$$

where:

ERM (Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM for the calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3(1), and

ERF (Energy Reported Final) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the final settlement timing provisions as specified in Section 4.3.5(1).

(3) Monthly data actual versus estimated performance metric

The per cent of energy estimated for monthly settlement is to be no greater than two per cent of the total energy reported for monthly settlement and is calculated as follows:

$$\text{\% of energy estimated} = \left(\frac{\sum ERM_E}{\sum ERM}\right) \times 100$$

where:

ERM_E (Estimated Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM with a MWh source flag of "E" for the calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3 (1), and

ERM (Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3(1).

(4) Final data actual versus estimated performance metric

The per cent of energy estimated for final settlement is to be no greater than one per cent of the total energy reported for monthly settlement and is calculated as follows:

$$\text{\% of energy estimated} = \left(\frac{\sum ERF_E}{\sum ERF}\right) \times 100$$

where:

ERF_E (Estimated Energy Reported Final) is the sum of the kWh of those intervals reported by the MDM with a MWh source flag of "E" for the calendar month no later than the final settlement timing provisions as specified in Section 4.3.5(1), and

ERF (Energy Reported Final) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the final settlement timing provisions as specified in Section 4.3.5(1).

10.2.6.2 Site-level data performance metrics

(1) Monthly data accuracy performance metric

The monthly data stream is required to fall within two per cent accuracy, where accuracy is calculated as follows:

$$\text{Accuracy} = \text{ABS}\left(\frac{\sum\text{ERM} - \sum\text{ERF}}{\sum\text{ERF}}\right) \times 100$$

where:

ERM (Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM for the calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3(1), and

ERF (Energy Reported Final) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the final settlement timing provisions as specified in Section 4.3.5(1).

(2) Monthly data actual versus estimated performance metric

The per cent of energy estimated for monthly settlement is to be no greater than two per cent of the total energy reported for monthly settlement and is calculated as follows:

$$\text{\% of energy estimated} = \left(\frac{\sum\text{ERM}_{\text{ES}}}{\sum\text{ERM}}\right) \times 100$$

where:

ERM_{ES} (Estimated Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM with a consumption (kWh) status of "ES" for the calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3(1), and

ERM (Energy Reported Monthly) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the monthly settlement timing provisions as specified in Section 4.3.3(1).

(3) Final data actual versus estimated performance metric

The per cent of energy estimated for final settlement is to be no greater than one per cent of the total energy reported for monthly settlement and is calculated as follows:

$$\text{\% of energy estimated} = \left(\frac{\sum\text{ERF}_{\text{ES}}}{\sum\text{ERF}}\right) \times 100$$

where:

ERF_{ES} (Estimated Energy Reported Final) is the sum of the kWh of those intervals reported by the MDM with a consumption (kWh) status of "ES" for the calendar month no later than the final settlement timing provisions as specified in Section 4.3.5(1), and

ERF (Energy Reported Final) is the sum of the kWh of those intervals reported by the MDM for the same calendar month no later than the final settlement timing provisions as specified in Section 4.3.5(1).

10.3 Cumulative meter data performance standards

The following section of the MDM performance standards deals with cumulative meters that are defined as per Industry Canada approved devices that measure and register the integral of an electrical quantity with respect to time. This section is also applicable to virtual metering points that are effective points of measurement that may or may not be physically locatable. Virtual metering points are the calculated values based on two or more cumulative meters.

10.3.1 Data collection

10.3.1.1 Data collection cycle

The MDM must obtain at least one meter reading from 100 per cent of cumulative meters at a minimum of once every six months using one of the approved meter reads as defined in Section 10.3.1.2. All micro-generation sites shall have their meters read at least once in each calendar month.

10.3.1.2 Definition of approved meter reads

An approved meter read shall be defined as any one of the three options shown below:

(1) a physical on-site meter read as approved by the MDM responsible for reading the meter

(2) a remote meter read performed by an automated meter reading system (AMR)

(3) estimates for sites with specific conditions as specified in Section 10.3.2.2(3)

10.3.1.3 Data collection elements

As a minimum, the data captured or verified during the data collection process must contain the following data elements:

(1) meter number

(2) date of meter read

(3) reading for all valid registers from the meter

10.3.2 Validation of meter data

10.3.2.1 Validation tests

The MDM shall validate all cumulative meters using the following validation tests. If the metering data passes the validation tests, the data shall be considered settlement-ready and shall be provided to the designated parties as per Section 10.3.4. Metering data that fails one or more validation tests shall be verified by the MDM as specified in Section 10.3.2.2(1).

Table 43. Cumulative metering validation tests

Check	Test	Description	Pass/fail criteria
Meter number	Compare meter number with expected meter number for site	Meter number must match expected meter number.	Pass: meter number = expected meter number Fail: meter number ≠ expected meter number
Number of dials	Compare the number of digits on meter reading with	The number of digits in meter reading must be equivalent to	Pass: no. of digits = expected no. of dials

Check	Test	Description	Pass/fail criteria
	expected number of digits for meter	the number of digits or dials on the meter display.	Fail: no. of digits ≠ expected no. of dials
High and low usage	Compare actual usage with historical usage (for energy meters only)	MDMs will continue to use their current high/low validation routines. These routines shall be published and made available to the market.	Pass: low limit < usage < high limit Fail: low limit > usage > high limit
High and low demand	Compare average demand with historical demand (for demand meters only)	MDMs will continue to use their current high/low validation routines. These routines shall be published and made available to the market.	Pass: low limit < demand < high limit Fail: low limit > demand > high limit

10.3.2.2 Verification, editing and estimation of data

(1) Verification of data

(a) If the meter reading fails one or more validation tests, the MDM shall verify the validity of the test failure.

(b) If the MDM determines that the metering data is valid, then the original meter reading shall be considered settlement ready and shall be provided as a verified and edited (VE) meter reading in the DCM and GCM.

(c) If the MDM determines that the data is invalid, then the MDM shall discard the failed data.

(2) Editing of data (data replacement)

(a) If a previously submitted meter reading is subsequently found by the MDM to be suspect, the MDM shall submit cancellation DCM(s) for the suspect meter reading. At least 95 per cent of cancellation DCMs shall be submitted by the MDM within one business day from the date of the discovery of the suspect meter reading and no greater than five per cent of cancellation DCMs shall be submitted no later than three business days from the date of the discovery of the suspect meter reading.

(b) If the cancellation DCM or GCM (as appropriate) causes the condition where there is no reported meter reading for the past two months, then the MDM shall provide replacement data for the cancellation DCM or GCM as soon as is practicable but in no circumstances greater than 20 business days from the date of the cancellation DCM or GCM.

(3) Estimation of data

(a) Estimation of meter reading data shall take place only in these circumstances:

(i) where a meter has failed and the meter reading cannot be obtained by any means

(ii) where energy diversion or theft has occurred

(iii) in the event that a meter read cannot be obtained at the time that the site is energized or de-energized

(iv) where the breaker is off and the meter has no power and cannot be read

(b) Under the circumstances specified in (a), the MDM shall provide a site-specific estimate of actual usage for the period from the last validated meter reading to a current date. The data shall be reported as estimated ("ES") meter reading in the DCM.

(c) Under the circumstances specified in (a), the MDM shall provide a site-specific estimate of small micro-generation for the period from the last validated meter reading to a current date. That estimation should be zero for the generated energy unless other relevant information is available. The data shall be reported as estimated ("ES") meter reading in the GCM.

10.3.2.3 Investigation and notification

(1) If a meter is found to be suspect as a result of the data verification, editing and estimation process, the MDM shall notify the owner of the meter within one business day.

(2) The owner of the meter shall be responsible for replacing or repairing the defective meter within 20 business days from the day of notification from the MDM of a suspect cumulative meter.

10.3.3 Data storage

In addition to requirements outlined in the *Electricity and Gas Inspection Regulations*, the MDM shall store all original meter readings, validation results, estimated readings, issued DCMs and cancelled DCMs, and issued GCMs and cancelled GCMs, for a period of at least 24 months from the last data revision date.

10.3.4 Data provision

(1) Subject to the general provisions of Section 10.1, the MDM shall provide load settlement-ready data in DCM records, as specified in Section 9.6.1.3, to the LSA and retailers, no later than the eighth business day from the date of the meter read.

(2) The MDM shall ensure that reporting of DCM data for a site will not generate date overlaps or leave date gaps with previously reported DCMs for that site – that is, for any valid site, the energy flow for any past single day must be accounted for in the effective time interval (as calculated from the difference between Current Reading Date Time field and Last Reading Date Time field) of one and only one DCM.

(3) The reporting date in the DCM Current Reading Date Time field shall be the date the meter was actually read. If the Current Meter Dial Reading field is the same as the Last Meter Dial Reading field contained in a DCM (i.e. zero consumption), the Current Reading Date Time field may be deemed to be any date that is between the current reading date and the last reading date.

(4) The reporting time in the DCM Current Reading Date Time field may, at the option of the MDM, be reported as actual meter read time or a consistently deemed meter read time between 00:00:00 and 23:59:59.

11 Compliance monitoring standards

11.1 Overview

The purpose of this section is to define compliance monitoring requirements and standards for market participants governed by the code.

11.1.1 Statements of disclosure

Each LSA shall provide statements of disclosure on some processes that are not transparent to market participants. Every LSA shall provide renewal of these statements whenever significant

changes to the methodologies have been made, or upon request by the Commission. Where the Commission determines that the disclosure is not sufficiently detailed, the LSA shall provide further details of disclosure. The following disclosures are required:

(1) Disclosure of profile methodology – an LSA is required to provide disclosure for profile methodologies. The disclosure should have sufficient information to allow retailers to understand the profile selection process and to enable retailers to verify and check the energy allocation to each site.

(2) Disclosure of loss calculation methodology – an LSA is required to provide disclosure for loss calculation methodologies, with sufficient detail to enable retailers to verify and check the losses allocated to each site.

(3) Disclosure of profile caps – an LSA is required to disclose the profile cap used in each settlement zone.

(4) Disclosure of individual site to settlement zone mapping rules utilized in Section 4.4.

11.2 Reporting requirements

This section is to define the reporting requirements for MDMs, LSAs, WOs and the ISO. These reporting requirements are based on performance standards contained in other sections or schedules of the code.

11.2.1 Interval metering data reporting requirements

(1) Each MDM shall submit a summary of interval metering results data and information to the ISO and Commission.

(2) The summary shall report system- and site-level metering metrics as stated in Section 10.2.6.1 and Section 10.2.6.2, in accordance with the MDM Interval Data Reporting Metrics template posted on the ISO's website (www.aeso.ca).

(3) The summary report shall be submitted via email to the compliance department at the ISO (loadsettlementcompliance@aeso.ca) by the end of the last business day of each month for the monthly and final settlements performed during the same month. For example, on July 29, 2011, the report will include data available to calculate the June 2011 monthly settlement and the March 2011 final settlement.

(4) The ISO will utilize this data to monitor the quality and completeness of interval metering inputs to load settlement and publish market wide MDM statistics by the end of the 12th business day of the next month.

11.2.2 System performance diagnostic report

Each LSA shall submit a system performance diagnostics report, based on performance tests as defined in Section 6.5.3 to the ISO and the Commission.

The LSA must provide further data and information to explain any unacceptable results, as requested by the ISO. The report shall:

(1) Include any unacceptable results from the tests, such as reconciliation errors, imbalances, or inconsistencies.

(2) Be submitted via email to the Compliance department at the ISO (loadsettlementcompliance@aeso.ca) within five business days of each final settlement run.

(3) Be provided in a format consistent with the System Performance Diagnostic Template posted on the ISO's website (www.aeso.ca).

The system performance diagnostic report template is intended for use by the LSAs to report their system performance diagnostic for each final settlement run. It is anticipated that the LSAs shall conduct all performance tests as described in Section 6.5.3.

11.2.3 Load settlement process reporting requirements

(1) LSAs and MDMs shall provide the ISO, upon request, records and evidence to demonstrate compliance with specific sections of this code. This includes specifically records to demonstrate that meter readings have occurred with site energization and de-energization activities, as established in Section 6.2.

Appendix A – Supplementary tables

The intent of this appendix is to facilitate any table revisions outside of the standard AUC rule-making process. In general, table revisions contemplated are those that would have little impact to market participants. Should table revisions are needed, the Commission will issue a bulletin notifying market participants. The ISO will continue the compliance monitoring functions based on information stated in the appendix.

Table A-1 PFAM application form

Instructions for filling in the PFAM application form:

- All fields, unless otherwise marked, are mandatory.
- Attach additional information labelled Appendix 1, 2, 3, etc.

LSA Contact Information		**Status (mark with an "x")**		
Contact Name:				
Company Name:		AGREE		
Phone Number:		DISAGREE		
Email Address:		DISMISSED (not investigated)		

Grey shaded sections to be completed by Complainant - Everything other than fields marked "optional" must be completed.				
Complainant Information:			**Date of Complainant Request:**	
Contact Name:				
Company Name:			**Time Period** From:	
Phone Number:			To:	
Email Address:				
			Affected Parties Information (if known)	
SITE ID #			Contact Name:	
Retailer ID #			Company Name:	
			Phone Number:	
SITE ADDRESS			Email Address:	
(optional)				
Details of Problem:				
Please submit original data and background information regarding error including $ and kWh estimates:				
Reasons for "disagree" by respondent:				
Response Date:			Signature of Respondent:	
Date sent to ISO by LSA: (if claim is "agreed" to by Respondent)			Respondent Name: Phone Number:	
			Email Address:	

Table A-2 Business function ID

Refer to the specific transactions in Section 9.6 and Section 9.7 to determine what the requirements are and when the business function IDs are to be used.

Code	Meaning
DE	Default retailer
LR	Supplier of last resort
RE	Competitive retailer
RR	Regulated rate provider retailer
SR	Self retailer

Table A-3 Wire services provider (WSP) ID

A four-digit number uniquely represents each wire services provider operating within Alberta.

Wires Co. ID	Wires Co. name	Active	Expiry
0010	ATCO	Jan 01, 2001	
0020	ENMAX	Jan 01, 2001	
0030	EPCOR	Jan 01, 2001	
0040	FortisAlberta	Jan 01, 2001	
0050	Lethbridge	Jan 01, 2001	
0060	Crowsnest Pass	Jan 01, 2001	Nov 15, 2016
0070	Red Deer	Jan 01, 2001	
0080	Ponoka	Jan 01, 2001	
0090	Fort Macleod	Jan 01, 2001	Sept 30, 2018
0100	Cardston	Jan 01, 2001	
0110	SouthAlta REA	Jan 01, 2001	Jan 01, 2013
0120	Rocky REA	Jan 01, 2001	Jan 15, 2019
0120	Blue Mountain Power Co-op	Jan 15, 2019	
0121	Horseguard REA	Jan 01, 2001	Sept 08, 2005
0130	Central REA	Jan 01, 2001	Jan 01, 2013
0130	EQUS REA	Jan 01, 2013	
0140	Battle River REA	Jan 01, 2001	Aug 11, 2015
0140	Battle River Power Coop	Aug 11, 2015	
0150	Barrhead REA	Jan 01, 2001	Mar 08, 2002
0151	Duffield REA	Jan 01, 2001	
0153	Wild Rose REA	Jan 01, 2001	
0154	Yellowhead REA	Jan 01, 2001	Jun 30, 2004
0155	N Parkland REA	Jan 01, 2001	
0156	Sion REA	Jan 01, 2001	May 20, 2005
0160	Manning REA	Jan 01, 2001	Aug 31, 2011
0165	Lakeland REA	Jan 01, 2001	

Table A-4 Load settlement agent (LSA) ID

A four-digit number uniquely represents each load settlement agent operating within Alberta.

LSA ID	Settlement zone	Load settlement agent name	Active	Expiry
1010	ATCO	ATCO	Jan 01, 2001	Dec 31, 2099
1020	City of Calgary	ENMAX	Jan 01, 2001	Dec 31, 2099
1030	City of Edmonton	EPCOR	Jan 01, 2001	Dec 31, 2099
1040	FortisAlberta	FortisAlberta	Jan 01, 2001	Dec 31, 2099
1050*	City of Lethbridge	Valeo Power (ENMAX Commercial Services Inc.)	Jan 01, 2001	Jan 31, 2018
1050	City of Lethbridge	Cognera	Feb 01, 2018	Dec 31, 2099
1060*	Crowsnest Pass	ENMAX	Jan 01, 2001	Nov 15, 2016
1070*	Red Deer	ENMAX	Jan 01, 2001	Dec 31, 2099
1080*	The Town of Ponoka	ENMAX	Jan 01, 2001	Dec 31, 2099
1090*	Fort MacLeod	ENMAX	Jan 01, 2001	Sept 30, 2018
1100*	Cardston	ENMAX	Jan 01, 2001	Dec 31, 2099
* Load settlement functions are currently contracted to a third party.				

Table A-5 Meter data manager (MDM) ID

A four-digit number uniquely represents each meter data management company operating within Alberta.

MDM ID	MDM name	Active	Expiry	DCM/ GCM	DIM/ GIM	DSM
2010	ATCO	Jan 01, 2001		Y	Y	Y
2020	ENMAX	Jan 01, 2001		Y	Y	Y
2030	EPCOR	Jan 01, 2001		Y	Y	Y
2040	FortisAlberta	Jan 01, 2001		Y	Y	Y
2050	Lethbridge	Jan 01, 2001		2170	2170	2170
2060	Crowsnest Pass	Jan 01, 2001	Nov 15, 2016	2020	2020	Y
2070	Red Deer	Jan 01, 2001		2020	Y	Y
2080	Simmarix	Jan 01, 2001	Sep 30, 2009	Y	Y	
2080	Ponoka	Oct 01, 2009		2020	2020	
2090	Fort MacLeod	Jan 01, 2001	Sept 30, 2018	2020	2020	
2100	Cardston	Jan 01, 2001		2020	2020	
2110	SouthAlta REA	Jan 01, 2001	Jan 01, 2013			
2120	Rocky REA	Jan 01, 2001	Jan 15, 2019	Y		
2120	Blue Mountain Power Co-op	Jan 15, 2019		Y		
2121	Horseguard REA	Jan 01, 2001	Sept 08, 2005			
2130	Central REA	Jan 01, 2001	Jan 01, 2013	Y		Y
2130	EQUS REA	Jan 01, 2013		Y		Y
2140	Battle River REA	Jan 01, 2001	Aug 11, 2015	Y		
2140	Battle River Power Coop	Aug 11, 2015		Y		
2150	Barrhead REA	Jan 01, 2001	Mar 08, 2002			
2151	Duffield REA	Jan 01, 2001				
2153	Wild Rose REA	Jan 01, 2001				
2154	Yellowhead REA	Jan 01, 2001	Jun 30, 2004			
2155	North Parkland Power REA	Jan 01, 2001				
2156	Sion REA	Jan 01, 2001	May 20, 2005			
2160	Manning REA	Jan 01, 2001	Aug 31, 2011			
2165	Lakeland REA	Jan 01, 2001				

MDM ID	MDM name	Active	Expiry	DCM/ GCM	DIM/ GIM	DSM
2170	MIDAS	Jan 01, 2001	Dec 01, 2015		Y	Y
2170	Rodan Energy Solutions Corp.	Dec 01, 2015		Y	Y	Y
2175	City of Medicine Hat	Jan 01, 2001				Y
2176	PowerEx	Jan 01, 2001				Y
2180	TransAlta	Jan 01, 2001				
2190	Trackflow	Jan 01, 2001	Feb 07, 2022-			Y
2195	AltaLink	Jan 01, 2001				Y
2200	UtilityNet	Jan 01, 2001		Y		
2210	R. Braun Contracting Ltd	Jan 31, 2018	Feb 07, 2022			
2220	Renegade Metering Corp.	Jun 24, 2026				

Table A-6 Settlement zone ID

A four-digit number that uniquely represents each settlement zone operating within Alberta. The ID is assigned by the LSA.

Settlement zone ID	Zone name	Active	Expiry
0001	ATCO	Jan 01, 2001	Dec 31, 2099
0501	ENMAX	Jan 01, 2001	Dec 31, 2099
1001	EPCOR	Jan 01, 2001	Dec 31, 2099
1002	EPCOR	Jan 01, 2001	Dec 31, 2099
1501	FortisAlberta	Jan 01, 2001	Dec 31, 2099
2001	Lethbridge	Jan 01, 2001	Dec 31, 2099
2101	Crowsnest Pass	Jan 01, 2001	Nov 15, 2016
2201	Red Deer	Jan 01, 2001	Dec 31, 2099
2301	Ponoka	Jan 01, 2001	Dec 31, 2099
2401	Fort MacLeod	Jan 01, 2001	Sept 30, 2018
2501	Cardston	Jan 01, 2001	Dec 31, 2099

Table A-7 DCM and GCM status flags

The following data status flags are mandatory for inclusion with all DCM or GCM transactions:

Code	Meaning
ME	Passed applicable validation tests as described in this code
VE	Failed validation tests as described in this code, but passed verification process
ES	Estimated based on methodology outlined in this code

Table A-8 Transaction status codes

Market participants' systems must only use SSC status codes related to the specific transaction(s) they are linked to. Transaction status code "0027" (Other - call distributor for details) should not be used in place of any of the listed transaction status codes unless no suitable code is found.

Universal transaction status codes

Status code	Description	Transaction	Sender	Recipient
0000	Transaction successful	All	WSP, LSA, MDM	Retailer
0001	Invalid transaction abbreviation	All	WSP, LSA, MDM	Retailer
0002	Invalid date time format	All	WSP, LSA, MDM	Retailer
0024	Invalid number of fields in the transaction	All	WSP, LSA, MDM	Retailer

Enrolment/de-enrolment transaction status codes

Status code	Description	Transaction	Sender	Recipient
0005	Invalid retailer ID	SRN, DSN, RDN	WSP, LSA	Retailer
0006	Invalid retailer ID – not eligible for new switches	SRN	LSA	Retailer
0007	Invalid retailer ID – not valid for this wire services provider	SRN	LSA	Retailer
0008	Invalid retailer ID for site	SRN, DSN, RDN	WSP	Retailer
0009	Invalid LSA ID	SRN	LSA	Retailer
0011	Invalid WSP ID	DSN, RDN	WSP	Retailer
0012	Invalid WSP ID for site	DSN, RDN	WSP	Retailer
0013	Invalid site ID	SRN, DSN, RDN	WSP, LSA	Retailer
0014	Site already enrolled with this retailer	SRN	LSA	Retailer
0015	Site ID has been removed from the site catalogue	SRN, DSN, RDN	WSP, LSA	Retailer
0016	Site not allowed to switch	SRN	LSA	Retailer
0017	Switch has already been processed for site	SRN	LSA	Retailer
0018	Invalid priority code	SRN	LSA	Retailer
0019	Incomplete grouped site information	SRN, DSN, RDN	WSP, LSA	Retailer
0021	Transaction Status Code field must be blank	SRN	LSA	Retailer
0022	Business Function ID field must be blank	SRN, DSN, RDN	WSP, LSA	Retailer
0026	Invalid business function ID	SRN, RDN	WSP, LSA	Retailer
0027	Other – call distributor for details	SRN, DSN, RDN	WSP, LSA	Retailer
0050	Site not eligible for RRO	SRN	LSA	Retailer
0051	Valid update customer information not received	SRN, DSN	LSA, WSP	Retailer
0190	Retailer Account Number field too long	SRN	LSA	Retailer
0191	Retailer Reference Number field too long	SRN	LSA	Retailer
0198	Requested de-select date greater than 60 days	DSN	LSA	Retailer
0200	Invalid de-select reason	DSN	LSA	Retailer
0201	Invalid requested de-select date - format, length	DSN	LSA	Retailer
0202	Already de-selected	DSN	LSA	Retailer
0551	Profiling Class field invalid – format, length, missing	SRN	LSA	Retailer
1002	Loss Group Code field invalid – format, length, missing	SRN	LSA	Retailer
1003	Enrolment Notification Code field invalid – format, length, missing	SRN	LSA	Retailer
1004	Retailer Account Number field invalid – format, length	SRN	LSA	Retailer
1005	Energized Indicator field invalid – format, length	SRN	LSA	Retailer
1052	Switch Date field invalid – format, length	SRN	LSA	Retailer
1209	De-select not requested	RDN	WSP	Retailer
1230	De-select cancellation too late	RDN	WSP	Retailer
1231	De-select not in progress	RDN	WSP	Retailer
8518	Pending enrolment already exists for site	RDN	WSP	Retailer
8719	Invalid retailer certification level for transaction	SRN	WSP	Retailer
8720	Site is not enrollable	SRN	WSP	Retailer

MDM transaction status codes

Status code	Description	Transaction	Sender	Recipient
0003	Invalid MDM ID	DCM, GCM, DIM, GIM, SRW	MDM	Retailer, WSP
0004	Invalid MDM ID for site	DCM, GCM, DIM, GIM, SRW	MDM	Retailer, WSP
0005	Invalid retailer ID	DCM, GCM, DIM, GIM, SRW	MDM	Retailer, WSP
0008	Invalid retailer ID for site	DCM, GCM, DIM, GIM, SRW	MDM	Retailer, WSP
0009	Invalid LSA ID	DCM, DIM, SRW	MDM	Retailer, WSP
0011	Invalid WSP ID	SRW	MDM	WSP
0012	Invalid WSP ID for site	SRW	MDM	WSP
0013	Invalid site ID	DCM, GCM, DIM, GIM, SRW	MDM	Retailer, WSP
0020	Invalid socket ID	DCM, DIM	MDM	Retailer, WSP
0021	Transaction Status Code must be blank	DCM, GCM, DIM, GIM	MDM	Retailer, WSP
0022	Business Function ID must be blank	DCM, DIM, SRW	MDM	Retailer, WSP
0026	Invalid business function ID	DCM, GCM	MDM	SRW
0196	Invalid meter information	DCM, GCM	MDM	Retailer
0501	Meter Number invalid – format, length	DCM, GCM	MDM	Retailer
0503	Max kVA invalid - format, length, missing	DCM, GCM	MDM	Retailer
0504	Max kW invalid - format, length, missing	DCM, GCM	MDM	Retailer
0505	Last Reading Date Time invalid – format, length	DCM, GCM	MDM	Retailer
0506	Current Reading Date Time invalid – format, length	DCM, GCM	MDM	Retailer
0507	Last Meter Dial Reading invalid – format, length	DCM, GCM	MDM	Retailer
0508	Current Meter Dial Reading invalid – format, length	DCM, GCM	MDM	Retailer
0509	Max Reading (Watt) invalid - format, length, missing on kWh meter	DCM, GCM	MDM	Retailer
0510	Max Reading (Volt amp) invalid - format, length, missing on kVA meter	DCM, GCM	MDM	Retailer
0511	Meter multiplier invalid - format, length, missing	DCM, GCM	MDM	Retailer
0515	Record Status invalid – format, length	DCM, GCM	MDM	Retailer
0516	Cumulative meter read to be cancelled does not exist	DCM, GCM	MDM	Retailer
0517	Fields differ from original meter read, cancel aborted	DCM, GCM	MDM	Retailer
0518	Use of one of the meter read dates would create an overlap	DCM, GCM	MDM	Retailer
0519	Records with a “CA” status encountered after regular reads, cancel aborted	DCM, GCM	MDM	Retailer
0520	Meter read values and consumption cannot be negative	DCM, GCM	MDM	Retailer
0550	Load Research Flag invalid – format, length, missing	DIM	MDM	Retailer
0551	Profile Class invalid – format, length, missing	DIM	MDM	Retailer
0552	kW invalid – format, length, missing	DIM, GIM	MDM	Retailer
0553	kWh invalid – format, length	DIM, GIM, GCM	MDM	Retailer
0554	kVA invalid – format, length, missing	DIM	MDM	Retailer
0555	kVAh invalid – format, length, missing	DIM	MDM	Retailer
0556	kVAR invalid – format, length, missing	DIM	MDM	Retailer
0557	kVARh invalid – format, length, missing	DIM	MDM	Retailer
0558	Date Time invalid – format, length, missing	DIM, GIM	MDM	Retailer

Status code	Description	Transaction	Sender	Recipient
0559	Interval Period invalid – format, length, missing	DIM, GIM	MDM	Retailer
0560	Hour Ending invalid – format, length, missing	DIM, GIM	MDM	Retailer
0561	Demand (kW) Status invalid – format, length	DIM, GIM, DCM	MDM	Retailer
0562	Consumption (kWh) Status invalid – format, length	DIM, GIM, DCM, GCM	MDM	Retailer
0563	Demand (kVA) Status invalid – format, length, missing	DIM, DCM	MDM	Retailer
0564	Demand (kVAh) Status invalid – format, length, missing	DIM	MDM	Retailer
0565	Demand (kVAR) Status invalid – format, length, missing	DIM	MDM	Retailer
0566	Demand (kVARh) Status invalid – format, length, missing	DIM	MDM	Retailer
0567	Profiling Class invalid or missing for sample meter record	DIM	MDM	Retailer
0568	Interval record would create a gap, previous read must be estimated	DIM	MDM	Retailer
0569	Meter read values and consumption cannot be negative, unless the site is set up as having distributed generation then consumption can be negative	DIM	MDM	Retailer
1052	Switch Date Time invalid – format, length	SRW	MDM	Retailer, WSP

LSA transaction status codes

Status code	Description	Transaction	Sender	Recipient
0005	Invalid retailer ID	WSI	LSA	Retailer
0008	Invalid retailer ID for site	WSI	LSA	Retailer
0009	Invalid LSA ID	WSI	LSA	Retailer
0013	Invalid site ID	WSI	LSA	Retailer
0021	Transaction Status Code must be blank	WSI	LSA	Retailer
0025	Zone ID invalid - format, length, missing	WSI	LSA	Retailer
0026	Invalid business function ID	WSI	LSA	Retailer
0559	Interval Period invalid – format, length, missing	WSI	LSA	Retailer
1100	WSP ID invalid – format, length	WSI	LSA	Retailer
1101	Settlement Run Date Time invalid – format, length, missing	WSI	LSA	Retailer
1102	Settlement As At Date Time invalid – format, length, missing	WSI	LSA	Retailer
1103	Settlement Type invalid – format, length, missing	WSI	LSA	Retailer
1104	Profile Cut-off Date invalid - format, length, missing	WSI	LSA	Retailer
1105	Settlement Interval Ending Time invalid – format, length, missing	WSI	LSA	Retailer
1107	Settlement Hour Ending invalid – format, length, missing	WSI	LSA	Retailer
1108	Retailer Total Usage (kWh) invalid – format, length, missing	WSI	LSA	Retailer
1109	Retailer Loss Total (kWh) invalid – format, length, missing	WSI	LSA	Retailer
1110	Retailer UFE Total (kWh) invalid – format, length, missing	WSI	LSA	Retailer
1111	Retailer Energy Grand Total (MWh) invalid – format, length, missing	WSI	LSA	Retailer

WSP transaction status codes

Status code	Description	Transaction	Sender	Recipient
0005	Invalid retailer ID	DEF, ENF	WSP	Retailer
0008	Invalid retailer ID for site	DEF, ENF	WSP	Retailer
0011	Invalid WSP ID	DEF, ENF	WSP	Retailer
0013	Invalid site ID	DEF, ENF	WSP	Retailer
0018	Invalid priority code	DEF, ENF	WSP	Retailer
0020	Invalid socket ID		WSP	Retailer
0026	Invalid business function ID	DEF, ENF	WSP	Retailer
0027	Other – call distributor for details	DEF, ENF	WSP	Retailer
0058	Meter Access Notes field too long		WSP	Retailer
1200	Already de-energized	DEF	WSP	Retailer
1201	Requested De-energize Date invalid – format, length, missing	DEF	WSP	Retailer
1202	Requested De-energize Reason Code invalid – format, length, missing	DEF	WSP	Retailer
1203	Already energized	ENF	WSP	Retailer
1204	Requested Energize Date invalid – format, length, missing	ENF	WSP	Retailer
1205	Distributor does not have infrastructure/not ready	ENF	WSP	Retailer
1206	De-energize not requested	RDR	WSP	Retailer
1208	Off-cycle read date invalid – format, length, missing		WSP	Retailer
1210	Customer – access refused	DEF, ENF	WSP	Retailer
1212	Contact Name missing or incorrect	DEF, ENF	WSP	Retailer
1213	Contact Phone Number missing or invalid	DEF, ENF	WSP	Retailer
1215	Request date cannot be in the past	DEF, ENF	WSP	Retailer
1216	Incorrect premises	DEF, ENF	WSP	Retailer
1217	Distributor – no access to site	DEF, ENF	WSP	Retailer
1218	No longer required	DEF, ENF	WSP	Retailer
1220	Site locked for CONP	ENF	WSP	Retailer
1221	Work volume exceeded	DEF	WSP	Retailer
1222	Customer safety/critical impact to customer	DEF, ENF	WSP	Retailer
1223	Customer not moving	DEF	WSP	Retailer
1224	Load limiter installed	DEF	WSP	Retailer
1225	More than one customer affected	DEF	WSP	Retailer
1226	New customer	DEF	WSP	Retailer
1304	Customer construction not completed	ENF	WSP	Retailer
1306	Meter base or meter socket issue/damage	ENF	WSP	Retailer
1317	Duplicate work order request	DEF, ENF	WSP	Retailer
1323	Seasonal/temperature disconnect policy in place	DEF	WSP	Retailer
1401	Temperature outside limits	DEF	Gas Distributor Only	Retailer
1402	Disconnect warning notice left at site	DEF	WSP	Retailer
8701	Message to WSP is too long	DEF, ENF	WSP	Retailer
8715	Breakers on at site	ENF	WSP	Retailer
8755	Tampering	ENF	WSP	Retailer
8760	Distributor safety	DEF, ENF	WSP	Retailer
8763	CONP – paid, receipt shown	DEF	WSP	Retailer
8764	Wrong De-Energize Reason Code received	DEF	WSP	Retailer

Retailer transaction status codes

Status code	Description	Transaction	Sender	Recipient
0005	Invalid retailer ID	GRS	Retailer	ISO
0013	Invalid site ID	GRS	Retailer	ISO
0024	Invalid number of fields in the transaction	GRS	Retailer	ISO

UCI transaction status codes - customer information

Status code	Description	Transaction	Sender	Recipient
0061	Customer first and last names not allowed with customer company name	UCI	Retailer	WSP
0062	Customer Company Name field too long	UCI	Retailer	WSP
0063	Customer first name required	UCI	Retailer	WSP
0064	Customer First Name field too long	UCI	Retailer	WSP
0065	Customer last name required	UCI	Retailer	WSP
0066	Customer Last Name field too long	UCI	Retailer	WSP
0068	Customer name required	UCI	Retailer	WSP
0069	Mailing Address City is required	UCI	Retailer	WSP
0070	Mailing Address City field too long	UCI	Retailer	WSP
0071	Invalid mailing address city quadrant	UCI	Retailer	WSP
0072	Mailing Address Compartment field too long	UCI	Retailer	WSP
0073	Mailing Address Country is required	UCI	Retailer	WSP
0074	Invalid Mailing Address country	UCI	Retailer	WSP
0075	Customer mailing address required	UCI	Retailer	WSP
0076	Invalid mailing address combination	UCI	Retailer	WSP
0080	Foreign Mailing Address field too long	UCI	Retailer	WSP
0084	Invalid mailing address general delivery indicator	UCI	Retailer	WSP
0085	Mailing Address House Number field too long	UCI	Retailer	WSP
0086	Mailing address house number required	UCI	Retailer	WSP
0087	Mailing Address Letter Carrier Depot field too long	UCI	Retailer	WSP
0088	Mailing Address Lot ID field too long	UCI	Retailer	WSP
0089	Mailing Address Mobile Route field too long	UCI	Retailer	WSP
0090	Mailing Address Post Office Box field too long	UCI	Retailer	WSP
0091	Mailing Address Post-Road Number field too long	UCI	Retailer	WSP
0092	Mailing address post-road number required	UCI	Retailer	WSP
0093	Invalid mailing address postal code/ zip code format	UCI	Retailer	WSP
0094	Mailing Address Pre-Road Number field too long	UCI	Retailer	WSP
0095	Mailing address pre-road number required	UCI	Retailer	WSP
0096	Mailing Address Invalid Province / State Code	UCI	Retailer	WSP
0097	Mailing Address Province / State Code is required	UCI	Retailer	WSP
0098	Mailing Address Retail Postal Outlet field too long	UCI	Retailer	WSP
0099	Invalid mailing address road type	UCI	Retailer	WSP
0100	Mailing address road type required	UCI	Retailer	WSP
0101	Mailing Address Rural Route field too long	UCI	Retailer	WSP
0102	Mailing Address Site Number field too long	UCI	Retailer	WSP
0103	Mailing address site number is only valid when used in combination with a rural route	UCI	Retailer	WSP
0104	Mailing Address Station Name field too long	UCI	Retailer	WSP
0105	Invalid mailing address street direction code	UCI	Retailer	WSP
0106	Mailing Address Street Name field too long	UCI	Retailer	WSP
0107	Mailing address street name required	UCI	Retailer	WSP
0108	Invalid mailing address street pre-direction code	UCI	Retailer	WSP
0109	Invalid mailing address street type code	UCI	Retailer	WSP
0110	Mailing Address street type code required	UCI	Retailer	WSP
0111	Mailing Address Suburban Service field too long	UCI	Retailer	WSP
0112	Invalid mailing address unit designator	UCI	Retailer	WSP

Status code	Description	Transaction	Sender	Recipient
0113	Mailing address unit designator not allowed with mailing address unit number	UCI	Retailer	WSP
0114	Mailing Address Unit Number field too long	UCI	Retailer	WSP
0115	Customer Email Address field too long	UCI	Retailer	WSP
0119	Invalid customer phone number	UCI	Retailer	WSP
0196	Operating as field too long	UCI	Retailer	WSP
0197	Alternate Customer Last Name field too long	UCI	Retailer	WSP
0198	Alternate Customer First Name field too long	UCI	Retailer	WSP
0199	Invalid alternate customer phone number	UCI	Retailer	WSP
0200	Alternate Customer Email Address field too long	UCI	Retailer	WSP
0201	Mailing Address Unit Designator field too long	UCI	Retailer	WSP
0202	Mailing Address Street Pre-Direction field too long	UCI	Retailer	WSP
0203	Mailing Address Street Type Code field too long	UCI	Retailer	WSP
0204	Mailing Address Street Direction field too long	UCI	Retailer	WSP
0205	Mailing Address Road Type field too long	UCI	Retailer	WSP

UCI transaction status codes - site contact information

Status code	Description	Transaction	Sender	Recipient
0122	Site Contact First Name field too long	UCI	Retailer	WSP
0123	Site contact first name required	UCI	Retailer	WSP
0124	Site Contact Last Name field too long	UCI	Retailer	WSP
0125	Site contact last name required	UCI	Retailer	WSP
0127	Site contact name is required	UCI	Retailer	WSP
0128	Site Contact Email Address field too long	UCI	Retailer	WSP
0132	Invalid site contact phone number	UCI	Retailer	WSP
0206	Site Contact Alternate First Name field too long	UCI	Retailer	WSP
0207	Site contact alternate first name required	UCI	Retailer	WSP
0208	Site Contact Alternate Last Name field too long	UCI	Retailer	WSP
0209	Site contact alternate last name required	UCI	Retailer	WSP
0210	Site Contact Alternate Email Address field too long	UCI	Retailer	WSP
0211	Invalid site contact alternate phone number	UCI	Retailer	WSP

UCI transaction status codes - general Information

Status code	Description	Transaction	Sender	Recipient
0008	Invalid retailer ID for site	UCI	Retailer	WSP
0013	Invalid site ID	UCI	Retailer	WSP
0053	Customer c/o or Attention field too long	UCI	Retailer	WSP
0054	Invalid critical to have power indicator	UCI	Retailer	WSP
0055	Critical to have power reason is required	UCI	Retailer	WSP
0056	Invalid critical to have power reason	UCI	Retailer	WSP
0212	Invalid WSP ID	UCI	Retailer	WSP

Table A-9 Transactions timing table

The following table details the timing of the transactions.

Process (could contain many transactions)	Transaction	Input from (data source)	Output to (e.g. LSA, MDM, MSP, retailer, all utilities, general public)	Work completion to notification delay (maximum)
Select retailer request	SRR	Retailer	LSA	Refer to Section 7.4
Select retailer notification	SRN	LSA	New retailer	Refer to Section 7.4
Notify old retailer	SRO	LSA	Old retailer	Refer to Section 7.4
LSA notify wires and MDM	SRW	LSA	MDM, WSP	Refer to Section 7.4
Update customer information	UCI	Retailer	WSP	Refer to Section 9.6.4.1
Request update to customer information	RUC	WSP	Retailer	Refer to Section 9.6.4.2
Energize request	ENR	Retailer	WSP	
Energize failure	ENF	WSP	Retailer	Refer to Section 9.6.7(3)
Energize completion to retailers and LSA	ENC	WSP	Retailer, MDM, LSA	Refer to Section 9.6.7(3)
De-energize request	DER	Retailer	WSP	
De-energize failure	DEF	WSP	Retailer	Refer to Section 9.6.7(3)
De-energize completion to retailers and LSA	DEC	WSP	Retailer, MDM, LSA	Refer to Section 9.6.7(3)
Request off-cycle meter read	ROR	Retailer	WSP	
Request off-cycle meter read completion	ROC	WSP	Retailer	Refer to Table A-12 in Appendix A
Revoke de-energize request	RDR	Retailer	WSP	
De-select request	DSR	Retailer	WSP	Refer to Section 9.6.8 Figure 2
De-select notification	DSN	WSP	LSA, MDM, retailer	Refer to Section 9.6.8 Figure 2
Revoke de-select request	RDS	Retailer	WSP	Refer to Section 9.6.8 Figure 2
Revoke de-select notification	RDN	WSP	Retailer	Refer to Section 9.6.8 Figure 2
Site metering characteristics	SMC	WSP	Retailer	Five business days

Process (could contain many transactions)	Transaction	Input from (data source)	Output to (e.g. LSA, MDM, MSP, retailer, all utilities, general public)	Work completion to notification delay (maximum)
Micro-generation retailer notification	GRN	WSP	Retailer	Five business days
Micro-generation retailer summary	GRS	Retailer	ISO	Refer to Section 9.6.6.4
Micro-generation interval meter readings to retailers	GIM	MDM	LSA, WSP, retailer	Refer to Section 4.3.2
Micro-generation cumulative meter reading to retailers	GCM	MDM	Retailer	Refer to Section 4.5.4
Daily interval meter readings to retailers and LSA	DIM	MDM	LSA, WSP, retailer	Refer to Section 4.3.2
Daily cumulative meter consumption to retailers and LSA	DCM	MDM	LSA, WSP, retailer	Refer to Section 10.3.4
POD interval consumption	DSM	MDM	LSA, ISO	Refer to Section 4.3.2
Settlement summary information	SSI	LSA	All retailers, ISO	Refer to Section 4.3
Settlement profile information	SPI	LSA	All retailers	Refer to Section 4.3
Wholesale settlement information	WSI	LSA	Retailer, ISO, client WSP	Refer to Section 4.3
Wholesale settlement summary	WSS	LSA	Retailer, ISO, client WSP	Refer to Section 4.3
Wholesale settlement details for retailer's own sites	WSD	LSA	Retailer	Refer to Section 4.3
Wholesale class information	WCI	LSA	Retailer, ISO, client WSP	Refer to Section 4.3
Retailer specific adjustment	RSA	LSA	ISO	Refer to Section 5.2.5
Retailer adjustment to market	RAM	LSA	ISO	Refer to Section 5.2.5
Transmission administrator adjustment	TAA	LSA	ISO	Refer to Section 5.2.5

Table A-10 ENR priority codes

Priority code	Description
1	Urgent reconnect – Reconnect in less than 24 hours The hour the WSP receives the ENR is counted as hour zero. Additional fee may be charged by the WSP. There is no expectation that WSPs can meet this priority on non-business days. Not to be used for new construction. If mistakenly used for sites under construction, the WSP can fail the order if the site is not ready but cannot fail it due to use of wrong code. If the wrong code is used, the WSP shall treat it as if it had come in as a priority code 4.
2	Rush reconnect – Reconnect in less than 48 hours The hour the WSP receives the ENR is counted as hour zero. Additional fee may be charged by the WSP. There is no expectation that WSPs can meet this priority on non-business days. Not to be used for new construction. If mistakenly used for sites under construction, the WSP can fail the order if the site is not ready but cannot fail it due to use of wrong code. If the wrong code is used, the WSP shall treat it as if it had come in as a priority code 4.
3	WSP's published standard level reconnect service.

4	New construction – For energizing sites that have been under construction and have never had a meter installed. As retailers may not always be aware when sites are under construction, mistakenly using priority codes 1, 2 or 3 when a site is under construction cannot be the basis for failing an ENR. When a WSP receives an ENR for a site under construction that was not coded as priority code 4, the WSP shall treat it as though it were coded as priority code 4.

Table A-11 DER priority codes

Priority code	Description
1	Standard level service – Disconnect within five business days.

Table A-12 ROR priority codes

Priority code	Description
1	Standard level service – Read meter within five business days.

Table A-13 Profile class reference table

Zone ID	Profile type	Profile class	Profile description
0001	SAMPLE	RES	Residential
0001	SAMPLE	FRM	Farm
0001	DEEMED	OIL	Oil
0001	SAMPLE	COM	General service small
0001	SAMPLE	IND	General service large
0001	DEEMED	LITE	Lighting
0001	DEEMED	IRR	Irrigation
0001	N/A	INTV	Interval metered sites < 2 MW
0001	N/A	INPD	Interval metered sites > 2 MW
0501	SAMPLE	CAL_RES	Residential
0501	NSLS	CAL_NSLS	All non-residential cumulative metered sites
0501	N/A	INTERVAL	All interval metered sites
0501	UNMETERED	CAL_STRTLT	Streetlights
0501	UNMETERED	CAL_FLAT	Unmetered sites
1001	N/A	INTERVAL	All interval metered sites
1001	NSLS	EDM_NSLS	Residential, small commercial and medium commercial cumulative metered sites
1001	UNMETERED FLAT	UNMETERED_FLAT	Unmetered sites
1001	UNMETERED NIGHT	UNMETERED_NIGHT	Unmetered Night Light sites
1002	N/A	INTERVAL	All interval metered sites
1501	NSLS	NSLS	All cumulative metered sites excluding irrigation and oil and gas cumulative metered sites
1501	IRRIGATION2000	IRRIGATION2000	Irrigation sites prior to April 1, 2004
1501	IRRIGATION2004	IRRIGATION2004	Irrigation sites after April 1, 2004
1501	LIGHTING2000	LIGHTING2000	Street Lighting Service (unmetered)
1501	FLAT2000	FLAT2000	Small unmetered sites
1501	PUMPING2000	PUMPING2000	Oil & Gas Service
1501	null	null	All interval metered sites where each site has an individual profile setup with profile name equal to the site ID
2201	NSLS	RDR_NSLS	All cumulative metered sites
2201	N/A	INTERVAL	All interval metered sites
2201	SAMPLE	RDR_STRTLT	Streetlights
2201	UNMETERED	RDR_TRFCLT	Unmetered sites
2301	NSLS	PNK_NSLS	All cumulative metered sites

Zone ID	Profile type	Profile class	Profile description
2301	N/A	INTERVAL	All interval metered sites
2301	UNMETERED	PNK_STRTLT	Streetlights
2301	UNMETERED	PNK_FLAT	Unmetered sites
2401	NSLS	FTM_NSLS	All cumulative metered sites
2401	UNMETERED	FTM_STRTLT	Streetlights
2401	UNMETERED	FTM_FLAT	Unmetered sites
2501	NSLS	CRD_NSLS	All cumulative metered sites
2501	UNMETERED	CRD_STRTLT	Streetlights
2501	UNMETERED	CRD_FLAT	Unmetered sites

Table A-14 Loss class reference table

Zone ID	Loss class	Loss class description
0001	RESSECN	Residential Secondary
0001	RESPRIM	Residential Primary
0001	RESTRAN	Residential Transmission
0001	FRMSECN	REA and Co Farm Secondary
0001	FRMPRIM	REA and Co Farm Primary
0001	FRMTRAN	REA and Co Farm Transmission
0001	COMSECN	Small General Service Secondary
0001	COMPRIM	Small General Service Primary
0001	COMTRAN	Small General Service Transmission
0001	IRRSECN	Irrigation Secondary
0001	IRRPRIM	Irrigation Primary
0001	IRRTRAN	Irrigation Transmission
0001	STLSSECN	Street Lighting Secondary
0001	STLSPRIM	Street Lighting Primary
0001	STLSTRAN	Street Lighting Transmission
0001	SENTSECN	Private Lighting Secondary
0001	SENTPRIM	Private Lighting Primary
0001	SENTTRAN	Private Lighting Transmission
0001	OILSECN	Oilfield Secondary
0001	OILPRIM	Oilfield Primary
0001	OILTRAN	Oilfield Transmission
0001	INDSECN	Industrial < 2 MW Secondary
0001	INDPRIM	Industrial < 2 MW Primary
0001	INDTRAN	Industrial < 2 MW Transmission
0001	INPDSECN	Industrial > 2 MW Secondary
0001	INPDPRIM	Industrial > 2 MW Primary
0001	INPDTRAN	Industrial > 2 MW Transmission
0501	L100	Residential
0501	L200	Small Commercial
0501	L300	Medium Commercial
0501	L310	Interval Secondary
0501	L410	Interval Primary
0501	L500	Streetlight
0501	L600	Distributed Generation
1001	Other	EDM_OTHER
1001	CS20	>5,000 kvA – Primary (CS20)
1001	CS21	>5,000 kvA – Primary (CS21)
1001	CS22	>5,000 kvA – Primary (CS22)
1001	CS23	>5,000 kvA – Primary (CS23)

Zone ID	Loss class	Loss class description
1001	CS24	>5,000 kvA – Primary (CS24)
1001	CS25	>5,000 kvA – Primary (CS25)
1001	CS26	>5,000 kvA – Primary (CS26)
1001	CS27	>5,000 kvA – Primary (CS27)
1001	CS28	>5,000 kvA – Primary (CS28)
1001	CS29	>5,000 kvA – Primary (CS29)
1001	CS30	>5,000 kvA – Primary (CS30)
1001	CS31	>5,000 kvA – Primary (CS31)
1001	CS32	>5,000 kvA – Primary (CS32)
1001	CS33	>5,000 kvA – Primary (CS33)
1001	CS34	>5,000 kvA – Primary (CS34)
1001	CS35	>5,000 kvA – Primary (CS35)
1001	CS37	>5,000 kvA – Primary (CS37)
1001	CS38	>5,000 kvA – Primary (CS38)
1001	CS39	>5,000 kvA – Primary (CS39)
1001	CS40	>5,000 kvA – Primary (CS40)
1001	CS41	>5,000 kvA – Primary (CS41)
1001	CS42	>5,000 kvA – Primary (CS42)
1001	CS43	>5,000 kvA – Primary (CS43)
1001	CS44	>5,000 kvA – Primary (CS44)
1001	CS45	>5,000 kvA – Primary (CS45)
1001	CS46	>5,000 kvA – Primary (CS46)
1002	DCC	Direct Connects
1501	RESIDENT	Residential Services
1501	UNCFARM	UNC Farm Service
1501	REAFARM	REA Farm Service
1501	UNCIRRIGAT	UNC Irrigation Service
1501	REAIRRIGAT	REA Irrigation Service
1501	EXTERLITE	Street Lighting Service, Festive Lighting Service, Exterior Lighting
1501	SMGENERAL	Small General Service
1501	PUMPING	Oil & Gas Service
1501	GENERAL	General Service
1501	LGGENTOU	Large General Service
1501	DCONNECT	Direct-connected Service
1501	TEMPENERGY	Opportunity Transmission
2201	RDR_PRI	Red Deer Primary
2201	RDR_SEC	Red Deer Secondary
2301	PNK_SYSTEM	Ponoka System
2501	CRD_SYSTEM	Cardston System

Table A-15 PFAM adjustment reason code table

PFAM reason code	Description	Reason for PFAM
2000	Meter read obtained after final settlement	To be used for cumulative meters only for cases where a WSD marked as an estimate is produced at final settlement and a read is obtained after final settlement.
2001	Meter multiplier error	For corrections of PT, CT or meter multiplier errors (i.e. for when the information regarding PT, CT or meter multiplier is wrong, and not for when their physical characteristics have changed) identified after final settlement.
2002	Crossed meter	For correction of crossed meters and addressing errors.

2003	Meter hardware or software malfunctions	For correction of any kind of errors relating to the physical characteristics of a meter or the meter data management system, excluding crossed meters, meter multiplier errors, meter read errors and load settlement software errors.
2004	Theft or meter bypass	For correction of errors due to theft or meter bypass found after final settlement.
2005	Meter read error	For situations where a replacement DCM or DIM is sent after final settlement where the need for the replacement DCM or DIM was due to a meter read error (not because of a crossed meter, meter multiplier error or a calculation error as described in PFAM Reason Code 2008). Also for a customer read that resulted in a DCM and was then found to be incorrect after final settlement.
2006	Energize and de-energize status error	For correction of errors caused by misinformation regarding energization status or for use in situations where no retailer was assigned to a site.
2007	Enrolment error	For situations where an incorrect retailer of record was assigned to a site for a period that was already final settled.
2008	Calculation error	For correcting load settlement system calculation errors, including profiling class errors and load settlement software errors.

Appendix B

Transaction Transport Mechanism - VLTrader

Appendix B – Transaction transport mechanism – VLTrader

The current transport mechanism for exchanging transactions is VLTrader. A complete description of the version, standards, roles, responsibilities and guidelines required to exchange transactions can be found on the AUC website.

B-1 VLTrader software upgrades

When coordinated deployment of a VLTrader upgrade or release proves necessary, the AUC will coordinate with market participants.

B-2 VLTrader outage communication

(1) When a market participant has identified that its VLTrader cannot connect to another participant, the participant identifying the problem should contact the other market participant to which connection cannot be made and inform that participant of the VLTrader connection failure.

(2) Whichever market participant is experiencing a VLTrader outage must inform all other impacted market participants of the VLTrader outage.

(a) The following information shall be included in the VLTrader outage notification:

(i) VLTrader outage start date and time and expected end date and time

(ii) description of the VLTrader outage

(iii) actions required by the connecting parties during or after the VLTrader outage

(iv) contact person or group for questions or concerns

(3) Changes to VLTrader outage duration shall be communicated and, if the length of the VLTrader outage is unknown, regular updates about the outage shall be sent.

(4) During a VLTrader outage market participants should repeat connection attempts for sending and receiving files until connection is restored. Market participants that do not continue to attempt connection risk their transactions being processed late.