AER Enhanced Production Audit Program on PETRINEX: Compliance Assessment Indicators (CAI) - Revised June 8, 2022

CAI #	CAI Name	Definition	Why An Issue	Possible Actions	Applicable Subtypes	Activity	Product	CAI Message	Trigger Value	Category	Weight
103	Unacceptable Oil Proration Factor – Proration Battery	Oil proration factor of 1.00000 has been reported for a proration battery.	*Directive 017: Measurement Requirements for the Oil and Gas Industry* (*Directive 017*), chapter 3 *Manual 011: How to Submit Volumetric Data to the AER,* appendix 4	Confirm the accuracy of the total estimated and actual oil production volumes determined for the wells linked to the battery.	322 342, 344, 345 362, 364, 367		OIL	[Fluid type] proration factor: [TolerancePctLow]		Error	4
104	Unacceptable Gas Proration Factor – Proration Battery	Gas proration factor of 1.00000 is reported for a proration battery.	*Directive 017*, chapter 3 *Manual 011: How to Submit Volumetric Data to the AER*, appendix 4	Confirm the accuracy of the total estimated and actual gas production volumes determined for the wells linked to the battery.	322 342 362, 363, 364, 366, 367		GAS	[Fluid type] proration factor: [TolerancePctLow]		Error	4
105	Unacceptable Water Proration Factor – Proration Battery	Water proration factor of 1.00000 has been reported for a proration battery.	*Directive 017*, chapter 3 *Manual 011: How to Submit Volumetric Data to the AER*, appendix 4	Confirm the accuracy of the total estimated and actual water production volumes determined for the wells linked to the battery.	322 342, 344, 345 362, 364, 367		WATER	[Fluid type] proration factor: [TolerancePctLow]		Error	4
106	Inappropriate Production Volumes – Well-Level (VME0037)	Condensate production has been reported for a well linked to a gas multiwell proration SE Alberta battery.	As outlined in *Manual 011: How to Submit Volumetric Data to the AER* the description for a gas multiwell proration SE Alberta battery states, "Well production is calculated and reported as prorated. Proration factors are based on proration tests and group measurements. These production facilities have no condensate production."	Confirm that the fluid has been reported accurately and ensure the facility subtype is correct.	363, 366	PROD	COND	[Fluid type] reported for [well count] well(s)	[Well count]	Error	4
108	Unacceptable Hours on Production/Injection – Abandoned/Suspended Well	Well hours on production or injection have exceeded the number of hours from the start of the month up to the abandonment or suspension date for a well that was either abandoned or suspended during the current month. CAI is triggered when the production/injection hours on a well are over reported for the month. Whenever an active well changes status to suspended, abandoned, or ministry suspended mid-month, the allowable hours are now calculated based on the status change date. Activity: PROD or INJ, Well mode: (01, 02, 03, 08, 14), (Suspended, Abandoned, Abandoned Zone, Junked & Abandoned, Abandon & Whip stocked).	*Directive 007*	Confirm the accuracy of the reported hours on production or injection and ensure that the abandonment/suspension date is correct.	None			Maximum producing hours exceeded for [well count] well(s): [Well 1], [Well 2], [Well 3], [Well 4], [Well 5]...	[Well count]	Error	4
109	Multiple Gas Dispositions – Gas Group Battery (VME0038)	Multiple destination points have been reported for gas dispositions at a gas group battery. Activity: DISP or PURDISP	As outlined in *Manual 011: How to Submit Volumetric Data to the AER*, a gas multiwell group battery is defined in part as A production reporting entity for two or more single-well gas batteries that are grouped and reported together under a single reporting code, where "all wells must deliver to a common facility."	Confirm the accuracy of the dispositions and ensure the facility delineation is appropriate.	361, 365		GAS	Gas dispositions to [Facility 1], [Facility 2], [Facility 3], [Facility 4], [Facility 5]...	[Facility count]	Error	4
112	Linked Well Status Fluid Type Inappropriate for Facility Subtype	The well fluid type linked to a facility is inappropriate for the facility subtype. Excludes 'Suspended' facilities. Removed status of SUSP, ABZONE, ABANDONED, ABANDONED WHIPSTOCK, AND JUNK.	*Directive 017* outlines the following criteria for wells linked to batteries: Oil batteries – All wells in the battery must be classified as **oil** wells Gas batteries producing oil – All wells in the battery must be classified as **gas** wells Gas proration batteries – All wells in a gas proration battery must be classified as **gas** wells	Confirm the accuracy of the facility subtype and well classifications, and ensure that the reporting requirements outlined in *Directive 060: Flaring, Incinerating, and Venting* (*Directive 060*) and *Directive 007* have been met.	311 321, 322 331 341, 342, 343, 344, 345 351 361, 362, 363, 364			Well status fluid type: [well fluid abbrev] for [well count] well(s): [Well 1], [Well 2], [Well 3], [Well 4], [Well 5]…		Error	4
113	Invalid Well Links – Single-Well Battery	Production has been reported for more than one well for a single-well battery.	Table 2 *Manual 011: How to Submit Volumetric Data to the AER* defines the following single-well batteries: - Crude oil single-well battery (subtype 311) – "A production facility for a **single** flow-lined crude oil well" - Crude bitumen single-well battery (subtype 331) – "A production facility for a **single** flow-lined crude bitumen well" - Gas single-well battery (subtype 351) – "A production facility for a **single** flow-lined gas well" Facilities classified into one of these subtypes may not report production for more than one well.	Confirm that the facility subtype is correct.	311 331 351			Number of wells reporting production [well count]	[Well count]	Error	4
116	Directive 017 Chapter 5 Approval, Gas Receipts – Single-Well Battery	Gas has been reported as a receipt into a single-well oil or gas battery. Activity: REC, FUEL, PURREC Exclude single-well facilities where (total receipts + total purchase receipts) = < fuel volume	Measurement by difference is defined as any situation where an unmeasured volume is determined by taking the difference between two or more measured volumes. Measurement by difference results in the unmeasured volume absorbing all the measurement error associated with the measured volumes.	Confirm that *Directive 017*, chapter 5 approval criteria pertaining to gas receipts have been met.	311 331 351	REC	GAS	Receipt of gas reported		Conditional	4
117	Directive 017 Chapter 5 Approval, Gas Receipts – Proration Battery	Total gas (including gas equivalent if applicable) reported as a receipt (including purchase receipts) into a proration battery is greater than 75% of the battery's gas dispositions (fuel + flare + vent + sales). Formula: (total receipts + total purchase receipts) ÷ (total DISP + total purchase DISP + fuel + flare + vent) × 100 > 75 Exclude facilities where (total receipts + total purchase receipts) = < fuel volume	Measurement by difference is defined as any situation where an unmeasured volume is determined by taking the difference between two or more measured volumes. Measurement by difference increases the uncertainty of the prorated well volume estimate and results in the unmeasured volume absorbing all the measurement error associated with the measured volumes.	Confirm the accuracy of the reported volumes and ensure that *Directive 017*, chapter 5 approval criteria pertaining to gas receipts has been met.	322 342 362, 363, 364, 366, 367		GAS	Gas receipts = [REC ÷ DISP × 100]% of Dispositions: Receipts =[Gas REC volume] 10^3 m^3 Dispositions = [Gas DISP volume] 10^3 m^3	[REC ÷ DISP × 100]	Conditional	4
118	Directive 017 Chapter 5 Approval, Oil Receipts – Oil/Bitumen Proration Battery	Total oil receipts at an oil or bitumen proration battery is greater than 1000 m^3 and greater than 100% of the total oil produced. Formula: (total receipt > 1000) and (total receipts ÷ total PROD) × 100 > 100	Measurement by difference is defined as any situation where an unmeasured volume is determined by taking the difference between two or more measured volumes. Measurement by difference increases the uncertainty of the prorated well volume estimate and results in the unmeasured volume absorbing all the measurement error associated with the measured volumes.	Confirm the accuracy of the reported volumes and ensure that *Directive 017*, chapter 5 approval criteria pertaining to oil receipts have been met.	322 342, 344, 345	REC		Oil receipts are > [Parameter 1] m^3 and [REC ÷ PROD × 100]% of production: Receipts = [Oil REC volume] m^3 Production = [Oil PROD volume] m^3	[REC ÷ PROD × 100]	Conditional	4

119	Excessive Venting – Gas Facility (VME0035)	Total gas vented is greater than 15 10^3 cubic metres (m^3)	The licensee or operator must use the decision tree analysis shown in figure 5 of *Directive 060* to evaluate all new and existing gas battery vents regardless of volume except for intermittent small sources (less than 100 m^3 per month). The AER does not consider venting an acceptable alternative to flaring. If gas volumes are sufficient to sustain stable combustion, the gas must be burned (or conserved). If venting is the only feasible alternative, it must meet the requirements in section 8 of *Directive 060* .	Confirm the accuracy of the reported volumes and ensure that *Directive 060* requirements pertaining to economic evaluations regarding conservation of gas have been met.	351 361, 362, 363, 364, 365, 366, 367 621, 622	VENT	GAS	[Activity ID]: [activity volume] 10^3 m^3	[Activity volume]	Conditional	4
120	Excessive Flaring – Gas Facility (VME0034)	Total gas flared is greater than 30 $10^3 m^3$	The licensee or operator must use the decision tree analysis shown in figure 5 of *Directive 060* to evaluate all new and existing gas battery flares regardless of volume except for intermittent small sources (less than 100 m^3 per month).	Confirm the accuracy of the reported volumes and ensure that *Directive 060* requirements pertaining to economic evaluations regarding conservation of gas have been met.	351 361, 362, 363, 364, 365, 366, 367 621, 622	FLARE	GAS	[Activity ID]: [activity volume] 10^3 m^3	[Activity volume]	Conditional	4
121	Excessive Venting – Oil/Bitumen Battery (VME0035)	Total gas vented is greater than 15 $10^3 m^3$	The AER's goal is to have the upstream petroleum industry continue to reduce the volume of solution gas routinely flared, incinerated, and vented. The AER does not consider venting an acceptable alternative to flaring. If gas volumes are sufficient to sustain stable combustion, the gas must be burned (or conserved). If venting is the only feasible alternative, it must meet the requirements in section 8 of *Directive 060* . The AER endorses the solution gas flaring and venting decision tree process as recommended by CASA. The licensee or operator must apply this decision tree to all flares and vents greater than 900 m^3/day and be able to demonstrate how each element of the decision tree was considered and, where applicable, implemented.	Confirm the accuracy of the reported volumes and ensure that *Directive 060* requirements pertaining to economic evaluations regarding conservation of solution gas have been met.	311 321, 322 331 341, 342, 343, 344, 345	VENT	GAS	[Activity ID]: [activity volume] 10^3 m^3	[Activity volume]	Conditional	3
122	Excessive Flaring – Oil/Bitumen Battery (VME0034)	Total gas flared is greater than 30 $10^3 m^3$	The AER's goal is to have the upstream petroleum industry continue to reduce the volume of solution gas routinely flared, incinerated, and vented.	Confirm the accuracy of the reported volumes and ensure that *Directive 060* requirements pertaining to economic evaluations regarding conservation of solution gas have been met.	311 321, 322 331 341, 342, 343, 344, 345	FLARE	GAS	[Activity ID]: [activity volume] 10^3 m^3	[Activity volume]	Conditional	3
123	Low Solution Gas Conservation Efficiency – Oil/Bitumen Battery	The calculated solution gas conservation efficiency percentage is less than 90% for an oil or bitumen battery with production > 30.0. Formula: (total PROD gas – Flare – Vent) ÷ total PROD gas × 100 < 90% and total PROD > 30.0	The AER's goal is to have the upstream petroleum industry continue to reduce the volume of solution gas routinely flared, incinerated, and vented. Conservation is defined as the recovery of solution gas for sale, for use as fuel for production facilities, for other useful purposes, or for beneficial injection into an oil or gas pool. Section 2.5 of *Directive 060* outlines criteria to be met in the determination of the need for conservation at an oil or bitumen battery.	Confirm the accuracy of the reported volumes and ensure that *Directive 060* requirements pertaining to conservation of solution gas have been met.	311 321, 322 331 341, 342, 343, 344, 345		GAS	Gas Production = [PROD volume] Flare = [Flare volume] Vent = [Vent volume] Efficiency Percent = [(PROD − FLARE − VENT) ÷ PROD × 100]%	[Efficiency Percent]	Conditional	3
125	Questionable Fuel Volume – Facility	Fuel usage is greater than +/- 75% of the expected fuel for that facility subtype.	AER Measurement Specialist has determined fuel usage volumes for a "typical" facility for all facility subtypes. When the reported fuel volume is outside the expected parameters, it is an indication that fuel usage may have been over- or understated which would have a direct impact on other gas volumes (e.g., flare, vent, sales) reported for the facility.	Confirm the accuracy of the reported fuel gas volumes.	311 321, 322 331 341, 342, 343 351 361, 362, 363, 364, 365, 366, 367 611 621	FUEL	GAS	[Activity ID]: [activity volume] 10^3 m^3	[Activity volume]	Anomaly	4
129	No Inventory Reported – Oil/Bitumen Battery	No inventory reports for active oil or bitumen facilities. Exclude shut-in facilities or where all the wells are shut in.	The formula used to determine actual monthly production volumes of each product for a battery is as follows: Total measured disposition volumes + Closing tank inventory − Opening tank inventory − Total measured receipt volumes If values (volumes) for any of the components in the formula are missing and should be there, inaccurate production volumes will be determined for the battery. Manual 011: How to Submit Volumetric Data to the AER states that "an operator will enter INVCL to report the volume held in inventory at the end of the production month. Closing inventory is the total closing inventory by product for the reporting facility. It includes only the volumes held in tanks and ... at the facility at the end of the production month." Section 12.3.1.4 of *Directive 017* states that, for multiwell proration batteries – PETRINEX Subtype 342, "Inventory at the proration battery is to be reported monthly to [PETRINEX]. Wells included in a proration battery are not eligible for the disposition equals production methodology."	Review the facility schematic to confirm the presence/absence of tanks and confirm the accuracy of the reported data.	311 321, 322 342, 344, 345			No INVOP, no INVCL		Anomaly	4
130	Excessive Oil Allocation Factor – Custom Treating Facility/Clean Oil Terminal	Oil proration factor reporting for a facility deviated from unity (1.00000) by more than +/- 5% for a Custom Treating or Clean Oil Terminal E.g., (Proration Factor < .95000) or (Proration Factor > 1.05000)	An allocation factor is a type of proration factor that is used at facilities where only fluids received by truck are handled, such as custom treating plants and third-party-operated clean oil terminals. The purpose of an allocation factor is similar to a proration factor. It is used to correct fluid receipt volumes (considered estimates) to actual volumes based on dispostion measurement taken at the outlet of the facility (and also considering tank inventory change). Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Allocation factors are therefore used to equitably correct all measurements for biased errors.	Investigate possible reasons for variances between estimated and actual oil volumes.	611, 612 671, 671, 675			Proration factor: [proration factor]	[Proration factor]	Anomaly	2

135	Excessive Gas Proration Factor (4) – Proration Battery	Gas proration factor deviated from unity (1.00000) by +/- 50% E.g., (Proration Factor < 0.50000) or (Proration Factor > 1.50000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual gas production volumes determined for the wells linked to the battery.	322 362, 363, 364, 366, 367		GAS	Proration factor: [proration factor]	[Proration factor]	Anomaly	4
136	Excessive Gas Proration Factor (3) – Proration Battery	Gas proration factor deviated from unity (1.00000) by +/- 20% to +/- 50% E.g., (Proration Factor ≥ 0.50000 and proration factor < 0.80000) or (Proration Factor > 1.20000 and proration factor ≤ 1.50000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual gas production volumes determined for the wells linked to the battery.	322 362, 363, 364, 366, 367		GAS	Proration factor: [proration factor]	[Proration factor]	Anomaly	3
137	Excessive Gas Proration Factor (2) – Proration Battery	Gas proration factor deviated from unity (1.00000) by +/- 15% to +/- 20% E.g., (Proration Factor ≥ 0.80000 and proration factor < 0.85000) or (Proration Factor > 1.15000 and proration factor ≤ 1.20000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual gas production volumes determined for the wells linked to the battery.	322 362, 364, 367		GAS	Proration factor: [proration factor]	[Proration factor]	Anomaly	2
138	Excessive Gas Proration Factor (1) – Proration Battery	Gas proration factor deviated from unity (1.00000) by +/- 10% to +/- 15% E.g., (Proration Factor ≥ 0.85000 and proration factor < 0.90000) or (Proration Factor > 1.10000 and proration factor ≤ 1.15000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual gas production volumes determined for the wells linked to the battery.	322 362, 364, 367		GAS	Proration factor: [proration factor]	[Proration factor]	Anomaly	1
143	Low Gas-Oil Ratio – Bitumen Battery	The calculated gas-oil ratio (GOR) is less than or equal to 2 m^3 gas/m^3 oil for a bitumen battery. Formula: (total PROD gas × 1000) ÷ total PROD oil ≤ 2 The GOR is calculated to 5 decimal places, then rounded to 4	*Manual 011: How to Submit Volumetric Data to the AER*, appendix 5 *Directive 060*, chapter 2.6	Confirm the accuracy of the reported volumes.	331 341, 342, 343, 344, 345			Gas Production = [PROD gas] 10^3 m^3 Oil Production = [PROD oil] m^3 GOR = [(PROD gas × 1000) ÷ PROD oil]	[GOR]	Anomaly	1
144	Low Gas-Oil Ratio – Oil Battery	The calculated gas-oil ratio (GOR) is less than or equal to 5 m^3 gas/m^3 oil for an oil battery. Formula: (total PROD gas × 1000) ÷ total PROD oil ≤ 5 The GOR is calculated to 5 decimal places, then rounded to 4	*Manual 011: How to Submit Volumetric Data to the AER*, appendix 5 *Directive 060*, chapter 2.6	Confirm the accuracy of the reported volumes.	311 321, 322			Gas Production = [PROD gas] 10^3 m^3 Oil Production = [PROD oil] m^3 GOR = [(PROD gas × 1000) ÷ PROD oil]	[GOR]	Anomaly	1
147	Identical Activity Volume Reported – 6 Month Duration - Battery	Identical production volumes have been reported for 6 months. Fluid: Oil or Gas or Water Activity: all except INVOP, INVCL, LDINVOP, LDINVCL, and ROYALTY	*Directive 007*	Confirm the accuracy of the reported volumes.	311 321, 322 331 341, 342, 343, 344, 345 351 361, 362, 363, 364, 365, 366, 367			Constant [product] [activity] = [product activity volume]	[product activity volume]	Anomaly	1

148	Blending Concerns – Oil/Bitumen Battery	The variance in density between the oil produced by the wells linked to an oil or bitumen battery and the condensate reported as a receipt into the battery may not have been accounted for through the reporting of a shrinkage volume. Formula: if PROD of Oil and (receipt of COND or any SP products or any MX products), must have a shrinkage > 0	Blending occurs when two liquids of dissimliar properties are mixed. This mixing results in volumetric discrepancies from the ideal combination, which would yield a volume that would be the sum of the two products. The discrepancy is usually shrinkage, which is the result of smaller molecules of the lighter hydrocarbon filling in the voids or spaces between larger molecules of the heavier hydrocarbon. The result is a combined liquid volume that is less than the sum of the two original volumes. This shrinkage must be determined and properly applied to volumes making up the liquid to ensure proper allocation and reporting. Blending shrinkage must be determined if the density difference between the hydrocarbon fluids exceeds 40.0 kilograms (kg) per m^3 and must be reported if the shrinkage volume causes the delivery point volume to shrink by more than 0.1% and more than the 0.1 m^3 reporting limit on PETRINEX. The blending and flashing shrinkage is reported as an "SHR" disposition of the facility.	Confirm that, if applicable, appropriate consideration has been given to the accurate determination and reporting of shrinkage due to blending of the fluids.	311 321, 322 331 341, 342, 343, 344, 345			Condensate + Spec + Mix Receipt(s) Volume = [REC COND + SP + MX]	[REC COND+SP+MX]	Anomaly	2
149	Blending Concerns – Gas Battery	The variance in density between the fluid produced by the wells linked to a gas battery and the oil reported as a receipt into the battery may not have been accounted for through the reporting of a shrinkage volume. Formula: if PROD of Cond and receipt of Oil, must have a shrinkage > 0	Blending occurs when two liquids of dissimliar properties are mixed. This mixing results in volumetric discrepancies from the ideal combination, which would yield a volume that would be the sum of the two products. The discrepancy is usually shrinkage, which is the result of smaller molecules of the lighter hydrocarbon filling in the voids or spaces between larger molecules of the heavier hydrocarbon. The result is a combined liquid volume that is less than the sum of the two original volumes. This shrinkage must be determined and properly applied to volumes making up the liquid to ensure proper allocation and reporting. Blending shrinkage must be determined if the density difference between the hydrocarbon fluids exceeds 40.0 kg/m^3 and must be reported if the shrinkage volume causes the delivery point volume to shrink by more than 0.1% and more than the 0.1 m^3 reporting limit on PETRINEX. The blending and flashing shrinkage is reported as an "SHR" disposition of the facility.	Confirm that, if applicable, appropriate consideration has been given to the accurate determination and reporting of shrinkage due to blending of the fluids.	351 361, 362, 363, 364, 365, 366, 367			Oil Receipt Volume = [REC OIL]	[REC OIL]	Anomaly	2
150	Questionable Use of Destination Codes – Disposition	Disposition codes (e.g., Petrinex jurisdictions Miscellaneous (MC) and BC, unique well identifier (UWI), or other Non-Petrinex jurisdictions) have been used to report a disposition out of a facility Products: WATER, FSHWTR, BRKWTR, GAS, C4-SP, COND, OIL, WASTE	When dispositions out of a facility are going to a destination that is reporting to PETRINEX, the receiving facility will report the receipt volume, which in turn will autopopulate a corresponding disposition volume for the delivering facility. However, if the product is being disposed of to a facility that **does not** report to PETRINEX, the disposition is input by the delivering facility and the accuracy of the reported volume needs to be manually verified. As dispositions are a component of the accounting formula used to determine total production for a facility, inaccurate disposition volumes result in inaccurate production volumes.	Confirm the accuracy of the reported codes.	207, 208 311, 321, 322 331 341, 342, 343, 344, 345 351 361, 362, 363, 364, 365, 366, 367 381 401, 402, 403, 404, 405, 406, 407 501, 502, 503, 504, 505, 506, 507, 508, 509 611, 612 621, 622 671, 673, 675 701 902, 903			A questionable disposition code has been used		Anomaly	4
151	Questionable Use of Destination Codes – Receipt	Receipt codes (e.g., Petrinex jurisdictions Miscellaneous (MC) and BC, unique well identifier (UWI), or other Non-Petrinex jurisdictions) have been used to report a receipt into a facility Products: WATER, FSHWTR, BRKWTR, GAS, C4-SP, COND, OIL, WASTE	Receipts into a facility are reported to PETRINEX by the receiving facility and accurate PETRINEX receipt codes must be used. However, if the product from a facility not reporting to PETRINEX , the receipt must be coded in accordance with appendix 3 Manual 011: How to Submit Volumetric Data to the AER. As receipts are a component of the accounting formula used to determine total production for a facility, inaccurate receipt volumes result in inaccurate production volumes.	Confirm the accuracy of the reported codes and volumes.	207, 208 311, 321, 322 331 341, 342, 343, 344, 345 351 361, 362, 363, 364, 365, 366, 367 381 401, 402, 403, 404, 405, 406, 407 501, 502, 503, 504, 505, 506, 507, 508, 509 611, 612 621, 622 671, 673, 675 701 902, 903			A questionable receipt code has been used		Anomaly	4
152	Invalid Gas Metering Difference – Battery	Gas metering difference has been reported for a battery.	For AER production reporting purposes, a "metering difference" is used to balance, on a monthly basis, any difference that occurs between the measured inlet/receipt volumes and the measured outlet/disposition volumes at a facility. Metering difference is generally acceptable as an accounting/reporting entity is a difference results from two or more measurements of the same product. Metering differences occur because no two measurement devices provide the identical volumes due to the uncertainties associated with the devices. However, a more significant cause of metering differences is that the product measured at the inlet to a facility is usually altered by the process within the facility, resulting in a different product or products being measured at the outlet of the facility. Metering differences may be used at injection/disposal systems, gas gathering systems, and gas plants. Metering differences **do not** apply to any measured or prorated batteries except crude oil multiwell group batteries (subtype 321) and crude bitumen multiwell group batteries (subtype 341).	Confirm all volumetric activities and quantities are accurate and reported correctly.	311 322 331 342, 343, 344, 345 351 361, 362, 363, 364, 365, 366, 367	DIFF	GAS	[Fluid type] metering difference	[Diff Volume]	Error	4

153	Invalid Water Metering Difference – Battery	Water metering difference has been reported for a battery.	For AER production reporting purposes, a "metering difference" is used to balance, on a monthly basis, any difference that occurs between the measured inlet/receipt volumes and the measured outlet/disposition volumes at a facility. Metering difference is generally acceptable as an accounting/reporting entity is a difference results from two or more measurements of the same product. Metering differences occur because no two measurement devices provide the identical volumes due to the uncertainties associated with the devices. However, a more significant cause of metering differences is that the product measured at the inlet to a facility is usually altered by the process within the facility, resulting in a different product or products being measured at the outlet of the facility. Metering differences may be used at injection/disposal systems, gas gathering systems, and gas plants. Metering differences **do not** apply to any measured or prorated batteries except crude oil multiwell group batteries (subtype 321) and crude bitumen multiwell group batteries (subtype 341).	Confirm all volumetric activities and quantities are accurate and reported correctly.	311 321, 322 331 341, 342, 343, 344, 345 351 361, 362, 363, 364, 365, 366, 367	DIFF	WATER	[Fluid type] metering difference	[Diff Volume]	Error	4
154	Invalid Oil Imbalance – Battery	Oil imbalance has been reported for a battery.		Confirm all volumetric activities and quantities are accurate and reported correctly.	311 321, 322 331 341, 342, 343, 344, 345 351 361, 362, 363, 364, 365, 366, 367	IMBAL	OIL	[Fluid type] imbalance	[Imbalance Volume]	Error	4
155	Excessive Oil Proration Factor (4) – Oil Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 40% E.g., (Proration factor < 0.60000) or (Proration factor > 1.40000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	322		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	4
156	Excessive Oil Proration Factor (3) – Oil Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 15% to +/- 40% E.g., (Proration factor ≥ 0.85000 and proration factor < 0.60000) or (Proration factor > 1.15000 and proration factor ≤ 1.40000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	322		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	3
157	Excessive Oil Proration Factor (2) – Oil Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 10% to +/- 15% E.g., (Proration factor ≥ 0.90000 and proration factor < 0.85000) or (Proration factor > 1.10000 and proration factor ≤ 1.15000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	322		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	2
158	Excessive Oil Proration Factor (1) – Oil Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 5% to +/- 10% E.g., (Proration factor ≥ 0.95000 and proration factor < 0.90000) or (Proration factor > 1.05000 and proration factor ≤ 1.10000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	322		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	1
159	Excessive Oil Proration Factor (4) – Bitumen Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 45% E.g., (Proration factor < 0.55000) or (Proration factor > 1.45000).	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	342, 344, 345		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	4

160	Excessive Oil Proration Factor (3) – Bitumen Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 35% to +/- 45% E.g., (Proration factor ≥ 0.65000 and proration factor < 0.55000) or (Proration factor > 1.35000 and proration factor ≤ 1.45000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	342, 344, 345		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	3
161	Excessive Oil Proration Factor (2) – Bitumen Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 25% to +/- 35% E.g., (Proration factor ≥ 0.75000 and proration factor < 0.65000) or (Proration factor > 1.25000 and proration factor ≤ 1.35000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	342, 344, 345		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	2
162	Excessive Oil Proration Factor (1) – Bitumen Proration Battery	Oil proration factor deviated from unity (1.00000) by +/- 15% to +/- 25% E.g., (Proration factor ≥ 0.85000 and proration factor < 0.75000) or (Proration factor > 1.15000 and proration factor ≤ 1.25000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual oil production volumes determined for the wells linked to the battery.	342, 344, 345		OIL	Proration factor: [proration factor]	[Proration factor]	Anomaly	1
163	Excessive Water Proration Factor (4) – Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 50% E.g., (Proration factor < 0.50000) or (Proration factor > 1.50000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	322 362, 364, 367		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	4
164	Excessive Water Proration Factor (3) – Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 20% to +/- 50% E.g., (Proration factor ≥ 0.80000 and proration factor < 0.50000) or (Proration factor > 1.20000 and proration factor ≤ 1.50000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	322 362, 364, 367		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	3
165	Excessive Water Proration Factor (2) – Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 15% to +/- 20% E.g., (Proration factor ≥ 0.85000 and proration factor < 0.80000) or (Proration factor > 1.15000 and proration factor ≤ 1.20000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	322 362, 364, 367		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	2

166	Excessive Water Proration Factor (1) – Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 10% to +/- 15% E.g., (Proration factor ≥ 0.90000 and proration factor < 0.85000) or (Proration factor > 1.10000 and proration factor ≤1.15000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	322 362, 364, 367		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	1
167	Excessive Water Proration Factor (4) – Bitumen Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 45% E.g., (Proration factor < 0.55000) or (Proration factor > 1.45000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	342, 344, 345		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	4
168	Excessive Water Proration Factor (3) – Bitumen Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 35% to +/- 45% E.g., (Proration factor ≥ 0.65000 and proration factor < 0.55000) or (Proration factor > 1.35000 and proration factor ≤ 1.45000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	342, 344, 345		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	3
169	Excessive Water Proration Factor (2) – Bitumen Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 25% to +/- 35% E.g., (Proration factor ≥ 0.75000 and proration factor < 0.65000) or (Proration factor > 1.25000 and proration factor ≤ 1.35000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	342, 344, 345		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	2
170	Excessive Water Proration Factor (1) – Bitumen Proration Battery	Water proration factor deviated from unity (1.00000) by +/- 15% to +/- 25% E.g., (Proration factor ≥ 0.85000 and proration factor < 0.75000) or (Proration factor > 1.15000 and proration factor ≤1.25000)	Proration is an accounting system or procedure where the total actual monthly battery production is equitably distributed among wells in the battery. In this type of system, proration factors are used to correct estimated volumes to actual volumes. Where a bias error occurs in a series of measurements, there will be no plus/minus and all of the measurements are assumed to be in error by the same amount and in the same direction. Proration factors are therefore used to equitably correct all measurements for biased errors. The purpose of a proration factor is to correct estimated production volumes to actual production volumes based on disposition measurements taken at the outlet of the facility, changes in tank inventories, and receipt measurements taken at the inlet of the facility.	Investigate possible reasons for variances between estimated and actual water production volumes determined for the wells linked to the battery.	342, 344, 345		WATER	Proration factor: [proration factor]	[Proration factor]	Anomaly	1
171	Missing Gas Volume for a crude oil well – Well-Level (VME0041)	Total oil production at a well is greater than 15 m^3, without a corresponding gas volume for a crude oil well.	Manual 011: How to Submit Volumetric Data to the AER states that "When oil production is reported at a crude oil or crude bitumen battery, an operator must report the gas that was producted at the facility," and that "An accurate report of all activities, products, volumes ... must be submitted for each operational well." Failure to report produced gas volumes will result in 1) unpaid royalties and 2) inaccurate reservoir decision making.	Confirm the accuracy of the reported volumes.	321, 322	PROD	OIL	Gas production not reported at well level for [well count] crude oil well(s) with production greater than [tolerance value low].	[Well count]	Error	4
172	Missing Gas Volume for a bitumen well – Well-Level (VME0042)	Total oil production at a well is greater than 50 m^3, without a corresponding gas volume for a bitumen well.	Manual 011: How to Submit Volumetric Data to the AER states that "When oil production is reported at a crude oil or crude bitumen battery, an operator must report the gas that was producted at the facility" and that "An accurate report of all activities, products, volumes ... must be submitted for each operational well." Failure to report produced gas volumes will result in 1) unpaid royalties 2) inaccurate reservoir decision making	Confirm the accuracy of the reported volumes.	341, 342, 343, 344, 345	PROD	OIL	Gas production not reported at well level for [well count] bitumen well(s) with production greater than [tolerance value low]	[Well count]	Error	4

173	Proration Factor reported for non-prorated battery (VME0036) – Oil	A proration factor has been reported for a non-prorated battery. Well fluid type: Oil	Measured facilties do not use estimated volumes to determine production. Therefore, a proration factor is not applicable. See *Manual 011: How to Submit Volumetric Data to the AER* , table 2.	Confirm the accuracy of the reporting and ensure the facility subtype is correct.	311 321 331 341, 343 351 361, 365			[Fluid type] proration factor reported for non-prorated battery	[Proration factor]	Error	4
174	Proration Factor reported for non-prorated battery (VME0036) – Gas	A proration factor has been reported for a non-prorated battery. Well fluid type: Gas	Measured facilties do not use estimated volumes to determine production. Therefore, a proration factor is not applicable. See *Manual 011: How to Submit Volumetric Data to the AER* , table 2.	Confirm the accuracy of the reporting and ensure the facility subtype is correct.	311 321 331 341, 343 351 361, 365			[Fluid type] proration factor reported for non-prorated battery	[Proration factor]	Error	4
175	Proration Factor reported for non-prorated battery (VME0036) – Water	A proration factor has been reported for a non-prorated battery. Well fluid type: Water	Measured facilties do not use estimated volumes to determine production. Therefore, a proration factor is not applicable. See *Manual 011: How to Submit Volumetric Data to the AER* , table 2.	Confirm the accuracy of the reporting and ensure the facility subtype is correct.	311 321 331 341, 343 351 361, 365			[Fluid type] proration factor reported for non-prorated battery	[Proration factor]	Error	4
176	Zero Fuel Volume – Facility	Fuel usage is zero Facilities with only Open/Close Inventory (INVOP, INVCL), Load Open/Close (LDINVOP/LDINVCL), Inventory Adjustment (INVADJ), Load Fluid Inventory Adjustment (LDINVADJ), Plant Process (PROC), Shrinkage (SHR), Metering Difference (DIFF), Imbalance (IMBAL), and Shut In (SHUTIN) are excluded.	*Directive 007*	Confirm the fuel is not being used at the wells/facility	311 321, 322 331 341, 342, 343 351 361, 362, 363, 364, 365, 366, 367 401, 402, 403, 404, 405, 406, 407 611, 621, 622	FUEL	GAS	Fuel usage is zero.		Anomaly	4
177	Excessive Water Allocation Factor – Custom Treating Facility	Water proration factor reported for a facility deviated from unity (1.00000) by more than +/- 10% for a Custom Treating Facility. E.g., (Proration Factor < 0.90) or (Proration Factor > 1.10)	*Directive 017* , chapter 3	Investigate possible reasons for variances between estimated and actual water volumes.	611, 612			Proration factor: [proration factor]	[Proration factor]	Anomaly	2