QUESTION:

a) Please provide an updated and complete YIS Generation Inventory that includes the rentals (and spares) for 2023-24. Format should be the same as "Appendix A: Existing Resources Technical Attributes" on p. 71 of the 10-Year Renewable Electricity Plan from 2020.

ANSWER:

(a)

Please see NY-YEC-1-2 Attachment 1 prepared based on 2023/24 GRA assumptions, including new diesel replacements and diesel rentals.

Revised Response based on YUB Order 2023-25, Appendix B

Board Order 2023-25, section 2(a), finds as follows:

> In respect of IR NY-YEC-1-2(a) and(b) and having considered the submissions in the table in Appendix B, the Board considers the prudency of expenditures and system reliability. YEC's response to this IR brings into question the reliability of the diesel units under a sustained N-1 condition as no evidence has been provided regarding the changed capacity of all diesel generator units. As a result, the Board directs YEC to provide either documentation or reasons that justify the changing of the dependable capacities for the diesel generator units.

YEC would like to clarify that in NY's IRs as filed there was no NY-YEC-1-2(b) – the question referenced as "b" was asked as NY-YEC-1-3(a) and the YEC reply was "Please see the response to NY-YEC-1-2."

Board Order 2023-25, Appendix B directs YEC, regarding the changed capacity of all diesel generator units, "to provide either documentation or reasons that justify the changing of the dependable capacities for the diesel generator units". The change referenced in NY's reply was increases in dependable capacities for YEC permanent diesel units since the 2021 GRA.

(a)

Please see NY-YEC-1-2 REVISED Attachment 1 prepared based on 2023/24 GRA assumptions, including new diesel replacements and diesel rentals. YEC corrected retirement dates for DD2 and DD5 and also the nameplate capacity for DD3 [from 1,000 kW to 1,030 kW].

As shown in the table below, YEC permanent diesel unit dependable capacities in the 2023/24 GRA have increased by approximately 3.0 MW in 2023 and by approximately 2.7 MW in 2024 compared with the 10-Year Renewable Electricity Plan dependable capacities used in the 2021 GRA for diesel units not retired by 2023 or 2024. As explained below, these changes in dependable capacities are based on updated assessments by Operations staff.

				2023/24 GRA 2023/24 F		2023/24 GRA 2024/25 F	
Location	**Original Unit #**	**Name Plate Capacity (kW)**	**2021 GRA based on 10-Year Plan Dependable Capacity (kW)**	**Dependable Capacity (kW)**	**Change from 2021 GRA (kW)**	**Dependable Capacity (kW)**	**Change from 2021 GRA (kW)**
Faro							
Diesel	FD7	3,000	2,800	3,000	200	3,000	200
		3,000	**2,800**	**3,000**	**200**	**3,000**	**200**
Dawson							
Diesel	DD1	800	650	850	200	850	200
	DD2	1,000	850	1,000	150		
	DD3	1,030	850	1,030	180	1,030	180
	DD4	1,440	1,000	1,440	440	1,440	440
	DD5	1,500	1,350	1,500	150		
	YM1	1,440	850	1,200	350	1,200	350
		7,210	**5,550**	**7,020**	**1,470**	**4,520**	**1,170**
Mayo							
Diesel	MD1	1,000	850	1,000	150	1,000	150
	MD2	1,000	850	1,000	150	1,000	150
	MD3	1,000	850	950	100	950	100
		3,000	**2,550**	**2,950**	**400**	**2,950**	**400**
Whitehorse							
Diesel	WD4	2,500	2,250	2,500	250	2,500	250
	WD5	2,500	2,250	2,500	250	2,500	250
	WD6	2,500	2,250	2,500	250	2,500	250
	WD7	3,300	2,800	3,000	200	3,000	200
		10,800	**9,550**	**10,500**	**950**	**10,500**	**950**
Total change					**3,020**		**2,720**

The increased 2023/24 GRA dependable capacities for existing units resulted from test runs that Operations staff performed on YEC diesel units in 2022 to determine whether

the units had limitations. During the test runs issues were found with some of the units and modifications were made as required [under O&M expenses] to bring the units back up closer to nameplate capacity. The change in DD1 dependable capacity in particular reflects the repairs completed due to a failed generator.

YEC performs test runs and updates dependable capacity on an ongoing basis. YEC is currently finding instances where some of the units have had to be derated again after putting the units through extended runs [for example, DD4].

Dependable Capacity based on YEC's 2023/24 GRA Assumptions

Location	Retirement Year	Original Unit #	Prime Mover Type	Dispatchable	Name Plate Capacity (kW)	2023/24 F Dependable Capacity (kW)	2024/25 F Dependable Capacity (kW)
Aishihik							
Hydro	2050	AH1	hydro	Yes	15,600	15,000	15,000
	2050	AH2	hydro	Yes	15,600	15,000	15,000
	2050	AH3	hydro	Yes	7,000	7,000	7,000
					38,200	**37,000**	**37,000**
Faro							
Diesel	2050	FD7	diesel	Yes	3,000	3,000	3,000
	2064	New Diesel	diesel	Yes	5,000		5,000
					8,000	**3,000**	**8,000**
Dawson							
Diesel	2050	DD1	diesel	Yes	800	850	850
	2024	DD2	diesel	Yes	1,000	1,000	0
	2050	DD3	diesel	Yes	1,030	1,030	1,030
	2050	DD4	diesel	Yes	1,440	1,440	1,440
	2024	DD5	diesel	Yes	1,500	1,500	0
	2050	YM1	diesel	Yes	1,440	1,200	1,200
					7,210	**7,020**	**4,520**
Mayo							
Diesel	2050	MD1	diesel	Yes	1,000	1,000	1,000
	2050	MD2	diesel	Yes	1,000	1,000	1,000
	2050	MD3	diesel	Yes	1,000	950	950
					3,000	**2,950**	**2,950**
Hydro	2050	MH1	hydro	Yes	2,550	1,500	1,500
	2050	MH2	hydro	Yes	2,550		
	2050	MBH1	hydro	Yes	5,310	2,500	2,500
	2050	MBH2	hydro	Yes	5,310	2,500	2,500
					15,720	**6,500**	**6,500**
Whitehorse							
Hydro	2050	WH1	hydro	Yes	5,800	3,500	3,500
	2050	WH2	hydro	Yes	5,800	4,138	4,138
	2050	WH3	hydro	Yes	8,400		
	2050	WH4	hydro	Yes	21,327	20,000	20,000
					41,327	**27,638**	**27,638**
Natural Gas	2055	WG1	Natural Gas	Yes	4,400	4,200	4,200
	2055	WG2	Natural Gas	Yes	4,400	4,200	4,200
	2055	WG3	Natural Gas	Yes	4,400	4,200	4,200
					13,200	**12,600**	**12,600**
Diesel	2050	WD4	diesel	Yes	2,500	2,500	2,500
	2050	WD5	diesel	Yes	2,500	2,500	2,500
	2050	WD6	diesel	Yes	2,500	2,500	2,500
	2050	WD7	diesel	Yes	3,300	3,000	3,000
					10,800	**10,500**	**10,500**

Location	Retirement Year	Original Unit #	Prime Mover Type	Dispatchable	Name Plate Capacity (kW)	Dependable Capacity (kW)	Dependable Capacity (kW)
YEC Diesel Rentals [excluding spares]							
Whitehorse			diesel	Yes	16,200	16,200	16,200
Faro			diesel	Yes	12,600	12,600	12,600
Mayo			diesel	Yes	7,200	7,200	7,200
					36,000	**36,000**	**36,000**
Spares			diesel	Yes	3,600	3,600	3,600
AEY Diesel							
		CD1	diesel	Yes	1,600	1,200	1,200
		TD1	diesel	Yes	1,500	1,200	1,200
		RD1	diesel	Yes	1,000	750	750
		HD1	diesel	Yes	1,750	1,500	1,500
		Pelly G1	diesel	Yes	275	200	200
		Pelly G2	diesel	Yes	600	400	400
		Pelly G3	diesel	Yes	300	200	200
		Stewart G1	diesel	Yes	150	100	100
					7,175	**5,550**	**5,550**
YEC [including rental without spares]				Hydro	95,247	71,138	71,138
				Natural Gas	13,200	12,600	12,600
				Diesel	65,010	59,470	61,970
				Total	173,457	143,208	145,708
AEY				Diesel	7,175	5,550	5,550
Yukon Grid				Hydro	95,247	71,138	71,138
				Natural Gas	13,200	12,600	12,600
				Diesel	72,185	65,020	67,520
				Total	180,632	148,758	151,258
N-1 Dependable Capacity [including rental without spares]				Hydro		34,138	34,138
				Natural Gas		12,600	12,600
				Diesel		63,520	66,020
				Total		110,258	112,758
				DSM		100	500
				Total		110,358	113,258

QUESTION:

Please provide the stacking order for thermal generation – two separate lists:

a) for 2023-24

b) for 2024-25

ANSWER:

(a) and (b)

The generation stacking order changes based on available information at the time of generation, including demand, available resources, system stability requirements, etc.

The following shows the approximate stacking order of thermal units. The stacking order for the 2024/25 winter will be revisited closer to the winter of 2024/25 based on available resources, system stability and condition of thermal units.

The stacking order is subject to (a) total thermal operation at each site not exceeding air emissions permit under normal operation conditions and (b) where feasible, maintain each rental operational hours under 500 hrs/28 days allowance as per contract. It is also important to note that the thermal units are only run when it is required if the other resource options are not adequate to meet the demand on the system.

Type/ Location	**Units**	**Notes**
YEC LNG	WG1, WG2 and WG3	
Whitehorse rentals		
Faro rentals		
Mayo rentals		
YEC Whitehorse diesel	WD4, WD5, WD6, WD7	
YEC Callison diesel	New units	Two 3.25 units potentially available for 2024/25 winter [or 2025/26 winter if delayed]

Type/ Location	Units	Notes
YEC Faro diesel	New units, FD7	Two 2.5 MW new diesel units added for 2024/25 winter
YEC Dawson diesel	DD4, DD3, DD2, DD1	DD2 and DD5 to be retired in 2024
YEC Mayo diesel	MD1, MD2, MD3	

Revised Response based on YUB Order 2023-25, Appendix B

Board Order 2023-25, section 2(b), finds as follows:

> In respect of IR NY-YEC-1-04, and having considered the submissions summarized in the table in Appendix B, the Board finds that Mr. Yee's request to put the relevant capacity limits with the stacking order will provide information useful to the Board. Therefore, the Board directs YEC to reproduce the stacking order with the relevant capacity limits for each of the units referenced.

(a) and (b)

The generation stacking order changes based on available information at the time of generation, including demand, available resources, system stability requirements, etc.

The following shows the approximate stacking order of thermal units at the time of preparation of the response. The stacking order for the remainder of the 2023/24 winter will be reviewed on an on-going basis and adjusted as considered necessary. The stacking order for the 2024/25 winter will be revisited closer to the winter of 2024/25 based on available resources, system stability and condition of thermal units, and will be adjusted on an on-going basis, as considered necessary.

The stacking order is subject to (a) total thermal operation at each site not exceeding air emissions permit under normal operation conditions and (b) where feasible, maintain each rental operational hours under 500 hrs/28 days allowance as per contract. It is also important to note that the thermal units are only run when it is required if the other resource options are not adequate to meet the demand on the system.

Type/ Location	Units	Notes
YEC LNG	WG1, WG2 and WG3	Total dependable capacity of 12.6 MW (4.2 MW each unit). See Note 1.
Whitehorse rentals	9 units 1.8 MW each, excluding one spare unit	Total dependable capacity of 16.2 MW. See Notes 1 and 2.
Faro rentals	7 units 1.8 MW each	Total dependable capacity of 12.6 MW. See Notes 1 and 2.
Mayo rentals	4 units 1.8 MW each, excluding one spare unit	Total dependable capacity of 7.2 MW. See Notes 1 and 2.
YEC Whitehorse diesel	WD4 (2.5 MW dependable capacity), WD5 (2.5 MW dependable capacity), WD6 (2.5 MW dependable capacity), WD7 (3 MW dependable capacity)	Total dependable capacity of 10.5 MW. See Note 1.
YEC Callison diesel	New units (two 3.25 MW units = 6.5 MW)	Two 3.25 units potentially available for 2024/25 winter [2023/24 GRA assumes delay to 2025/26 winter]. See Note 1.
YEC Faro diesel	New units (two 2.5 MW units = 5 MW), FD7 (3 MW dependable capacity)	Two 2.5 MW new diesel units added for 2024/25 winter. See Note 1.
YEC Dawson diesel	DD4 (1.440 MW dependable capacity), DD3 (1.030 MW dependable capacity), DD2 (1 MW dependable capacity), DD1 (0.850 MW dependable capacity)	DD2 and DD5 to be retired in 2024. See Note 1.
YEC Mayo diesel	MD1 (1 MW dependable capacity), MD2 (1 MW dependable capacity), MD3 (0.950 MW dependable capacity)	See Note 1.

Notes:

1. Total thermal operation at each site not exceeding air emissions permit under normal operation conditions (total is 13.2 MW for Whitehorse LNG, 16.15 MW for Whitehorse diesel, 15.5 MW for Faro diesel, 7.1 MW for Dawson diesel, 15.5 MW for Callison diesel pending completion of permitting, and 7.9 MW for Mayo diesel including 4.9 MW new permit and 3 MW for Mayo town).
2. Where feasible, maintain each rental operational hours under 500 hrs/28 days allowance as per contract.

The generation stacking order is subject to changes based on available information at the time of generation, including demand, available resources, system stability requirements, etc. The Operations personnel can change the stacking order to respond to the demand on the system and available resources [for example, the staff can elect to run FD7 unit ahead of WD4, WD5 and WD6 units depending on the load on the grid, etc.].

REFERENCE: Faro diesel replacement, modifications to the FGS

QUESTION:

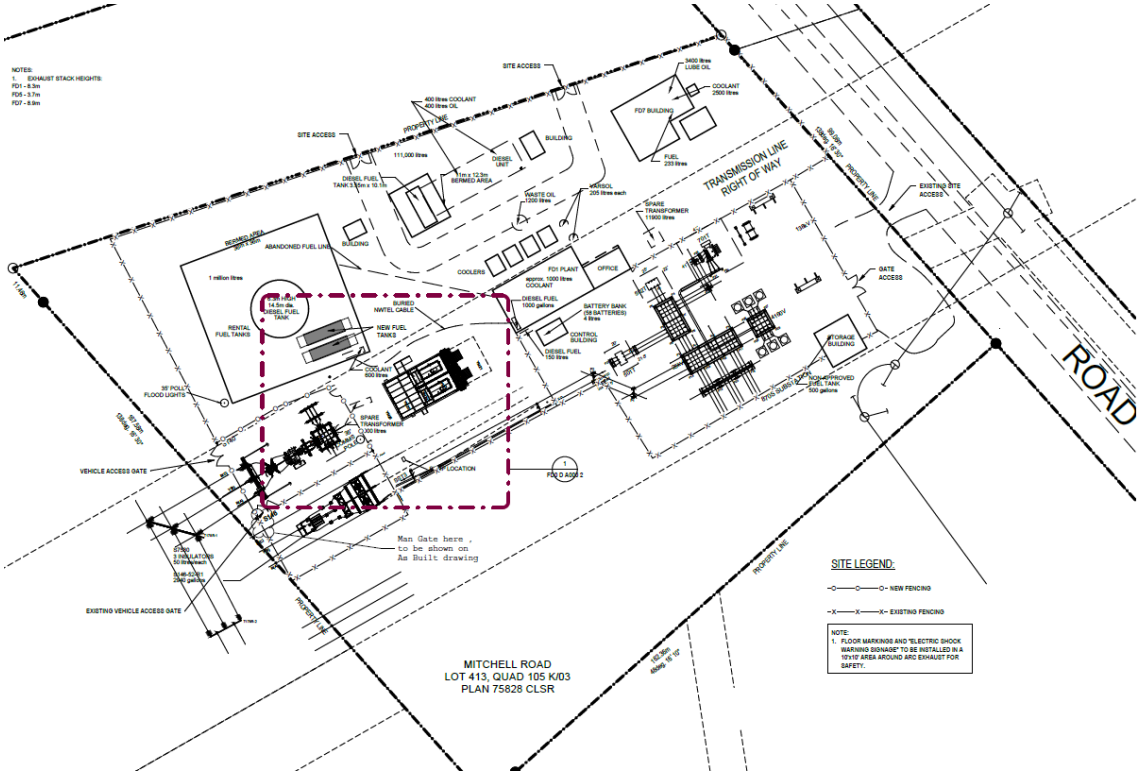
a) Please provide all plans, layouts, specifications, studies (noise, emissions, etc) and all other documentation relating to the modifications (2023 and 2024) to the FGS. This would also include plans, requirements and instructions given to contractors and subcontractors. Also please provide a list of contractors and subcontractors and RFPs.

b) Please provide all correspondence between YEC and the Department of Environment concerning the 2023 and 2024 modifications to the FGS.

ANSWER:

(a)

YEC is installing two Tier 4 engines of 2.5MW each. The layout of the site is as follows:



Contractors and subcontractors include:

- General Contractor (general construction, supervision, mechanical install, civil construction) – Wildstone Construction Group;
- Major Equipment Supplier and Commissioning Agent – Finning;
- Electrical Subcontractor – Westpark;
- Tank and mechanical material supplier – Keller;
- Formwork and reinforcing steel subcontractor – A&T;
- Concrete supplier – General Enterprises;
- Concrete finishing subcontractor – JLB;
- Containment subcontractor – Albarrie;
- Fencing subcontractor – Olson Fencing.

Revised Response for "a" based on YUB Order 2023-25, Appendix B

Board Order 2023-25, section (d), finds as follows in respect of IR NY-YEC-1-14(a), and having considered the submissions in the table in Appendix B:

> The Board finds that Mr. Yee's request is reasonable, and the information requested may be of assistance to the Board. The Board therefore directs YEC to produce a higher resolution copy of the site layout as requested by Mr. Yee. Further, if YEC has the information on the specifications and model number of the generators to the FGS, it shall provide that response to Mr. Yee. If YEC does not have the specifications and model numbers, then it shall confirm that fact.

(a)

The additional information required from YEC for the two Tier 4 engines of 2.5 MW each that YEC is installing at the FGS is provided below.

Please see NY-YEC-1-14 REVISED Attachment 1 for a copy of Cat C175-16 Tier 4 Final Product Specifications brochure applicable for these two engines. Please note that the power output of the CATs is 2.5 MW each at a Continuous Rating.

Please see NY-YEC-1-14 REVISED Attachment 2 for a copy of a high-resolution site layout for the two new diesel units [FD8 and FD9].

(b)

The 2023 email thread between T. Ritchie (YEC) and Elizabeth Barker (Yukon Government) regarding the FGS is included as NY-YEC-1-14(b) Attachment 1. The 2023 email thread between T. Ritchie (YEC) and Emily Sessford (Yukon Government) is included as NY-YEC-1-14(b) Attachment 2.

Cat® C175-16

Diesel Generator Sets

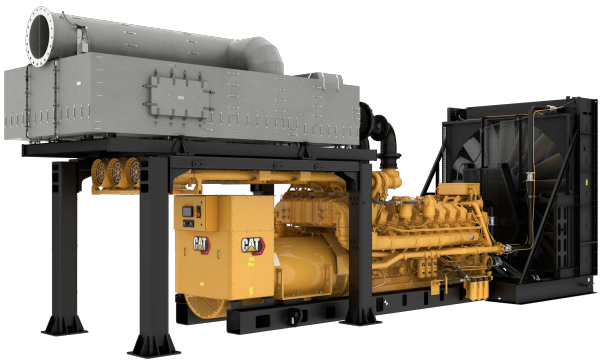


Image shown may not reflect actual configuration

Bore – mm (in)	175 (6.89)
Stroke – mm (in)	220 (8.66)
Displacement – L (in^3)	84.7 (5167)
Compression Ratio	16.7:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A4

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
3000 (3750)	3000 (3750)	2725 (3406)	2500 (3125)	U.S. EPA Tier 4 Final

Features

Cat® Diesel Engine
- Meets U.S. EPA Tier 4 Final emission standards
- Reliable performance proven in thousands of applications worldwide
- Certified alternative fuels including Hydrotreated Vegetable Oil (HVO), Renewable Diesel (RD) and Hydrotreated Renewable Diesel (HRD) which meet EN 15940 or ASTM D975 can be used or blended with EN 590 diesel

Generator Set Package
- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements
- Reliability verified through torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators
- Superior motor starting capability minimizes need for oversizing generator
- Designed to match performance and output characteristics of Cat diesel engines

Cooling System
- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

Clean Emissions Module
- Diesel oxidation catalyst for particulate matter (PM) and hydrocarbon (HC) control
- Selective catalytic reduction (SCR) for nitrogen oxides (NOx) control
- Integrated electronics for monitoring, protection, and closed loop NOx control

Cat Energy Control System (ECS)
- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements
- Graphical touchscreen display
- Easily upgradeable

Warranty
- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing
- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

C175-16 Diesel Generator Sets
Electric Power

Standard and Optional Equipment

Engine

Air Cleaner

❑ Single element
❑ Dual element

Starting

❑ Standard batteries
❑ Oversized batteries
❑ Standard electric starter(s)
❑ Dual electric starter(s)
❑ Air starter(s)
❑ Jacket water heater

Alternator

Output voltage

❑ 480V ❑ 6900V
❑ 600V ❑ 12470V
❑ 4160V ❑ 13200V
❑ 6300V ❑ 13800V
❑ 6600V

Temperature Rise (over 40°C ambient)

❑ 150°C
❑ 125°C/130°C
❑ 105°C
❑ 80°C

Winding type

❑ Form wound

Excitation

❑ Permanent magnet (PM)

Attachments

❑ Anti-condensation heater
❑ Stator and bearing temperature monitoring and protection

Power Termination

Type

❑ Bus bar
❑ Circuit breaker
❑ 4000A ❑ 5000A
❑ UL ❑ IEC
❑ 3-pole
❑ Electrically operated

Trip Unit

❑ LSI ❑ LSI-G
❑ LSIG-P

Control System

Controller

❑ Cat ECS 100
❑ EMCP 4.4

Attachments

❑ Local annunciator module
❑ Remote annunciator module
❑ Expansion I/O module
❑ Remote monitoring software

Charging

❑ Battery charger – 20A
❑ Battery charger – 35A
❑ Battery charger – 50A

Vibration Isolators

❑ Rubber
❑ Spring
❑ Seismic rated

Cat Connect

Connectivity

❑ Ethernet
❑ Cellular

Extended Service Options

Terms

❑ 2 year (prime)
❑ 3 year
❑ 5 year
❑ 10 year

Coverage

❑ Silver
❑ Gold
❑ Platinum
❑ Platinum Plus

Ancillary Equipment

❑ Automatic transfer switch (ATS)
❑ Paralleling switchgear
❑ Paralleling controls

Certifications

❑ IBC seismic certification
❑ OSHPD pre-approval

Note: *Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.*

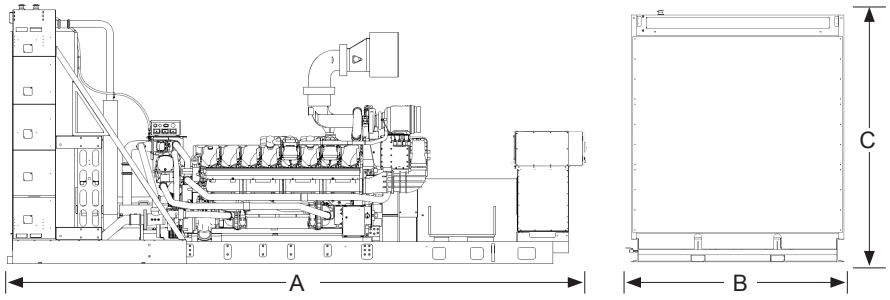
C175-16 Diesel Generator Sets
Electric Power

Package Performance

Performance	Standby		Mission Critical		Prime		Continuous	
Frequency	60 Hz		60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	3000 ekW		3000 ekW		2725 ekW		2500 ekW	
Gen set power rating with fan @ 0.8 power factor	3750 kVA		3750 kVA		3406 kVA		3125 kVA	
Emissions	Tier 4 Final		Tier 4 Final		Tier 4 Final		Tier 4 Final	
Performance number	DM8955-05		EM0315-04		DM8956-04		DM8957-05	
Fuel Consumption								
100% load with fan – L/hr (gal/hr)	765.1	(202.1)	765.1	(202.1)	705.0	(186.2)	637.8	(168.5)
75% load with fan – L/hr (gal/hr)	596.7	(157.6)	596.7	(157.6)	558.9	(147.6)	518.0	(136.9)
50% load with fan – L/hr (gal/hr)	451.1	(119.2)	451.1	(119.2)	429.5	(113.5)	396.8	(104.8)
25% load with fan – L/hr (gal/hr)	282.7	(74.7)	282.7	(74.7)	271.2	(71.6)	251.6	(66.5)
Diesel Exhaust Fluid (DEF) Consumption								
100% load with fan – L/hr (gal/hr)	50.7	(13.4)	50.7	(13.4)	45.6	(12.0)	39.2	(10.3)
75% load with fan – L/hr (gal/hr)	30.4	(8.0)	30.4	(8.0)	25.5	(6.7)	22.1	(5.7)
50% load with fan – L/hr (gal/hr)	15.7	(4.1)	15.7	(4.1)	13.8	(3.6)	12.6	(3.2)
25% load with fan – L/hr (gal/hr)	7.4	(2.0)	7.4	(2.0)	6.9	(1.8)	6.5	(1.6)
Cooling System								
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m^3/min (cfm)	3188	(112583)	3188	(112583)	3188	(112583)	3188	(112583)
Engine coolant capacity – L (gal)	303.5	(80.2)	303.5	(80.2)	303.5	(80.2)	303.5	(80.2)
Radiator coolant capacity – L (gal)	685.2	(181.0)	685.2	(181.0)	685.2	(181.0)	685.2	(181.0)
Total coolant capacity – L (gal)	988.7	(261.2)	988.7	(261.2)	988.7	(261.2)	988.7	(261.2)
Inlet Air								
Combustion air inlet flow rate – m^3/min (cfm)	259.3	(9155.0)	259.3	(9155.0)	242.7	(8570.0)	230.5	(8138.0)
Exhaust System								
Exhaust stack gas temperature – °C (°F)	472.3	(882.2)	472.3	(882.2)	460.0	(860.0)	452.7	(846.9)
Exhaust gas flow rate – m^3/min (cfm)	667.2	(23557.7)	667.2	(23557.7)	610.0	(21540.9)	570.4	(20139.6)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)
CEM outlet temperature – °C (°F)	465.5	(869.9)	465.5	(869.9)	451.1	(844.0)	444.0	(831.2)
Heat Rejection								
Heat rejection to jacket water – kW (Btu/min)	1373	(78075)	1373	(78075)	1229	(69901)	1125	(63972)
Heat rejection to exhaust (total) – kW (Btu/min)	3112	(176964)	3112	(176964)	2796	(159003)	2587	(147112)
Heat rejection to aftercooler – kW (Btu/min)	379	(21574)	379	(21574)	329	(18728)	296	(16810)
Heat rejection to atmosphere from engine – kW (Btu/min)	175	(9978)	175	(9978)	167	(9498)	162	(9237)
Heat rejection to atmosphere from CEM – kW (Btu/min)	53	(3026)	53	(3026)	48	(2756)	45	(2534)
Heat rejection from alternator – kW (Btu/min)	112	(6369)	112	(6369)	99	(5619)	91	(5158)

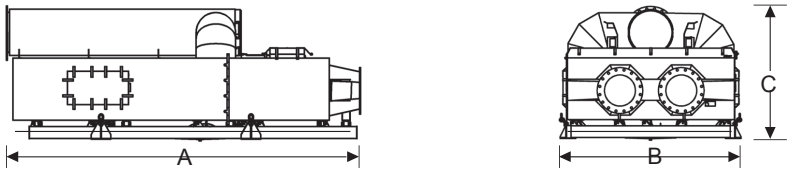
C175-16 Diesel Generator Sets
Electric Power

Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
8127 (320.0)	3118 (122.8)	3614 (142.3)	20 463 (45,114)

Note: *For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.*



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
4579 (180.3)	2361 (92.9)	1735 (68.3)	2900 (6393)

Ratings Definitions

Standby
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby rated ekW. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical rated ekW. Typical peak demand up to 100% of rated ekW for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime
Output available with varying load for an unlimited time. Average power output is 70% of the prime rated ekW. Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous
Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous rated ekW. Typical peak demand is 100% of continuous rated ekW for 100% of the operating hours.

Applicable Codes and Standards
AS 1359, UL 489, UL 869A, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU and facilitates compliance to NFPA 37, NFPA 70, NFPA 99, NFPA 110.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates
Fuel consumption reported in accordance with ISO 3046-1, based on fuel oil of 35º API [16°C (60ºF)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 15ºC (59ºF) and weighing 850 g/liter (7.0936 lbs/U.S. gal.) All fuel consumption values refer to rated engine power.

www.cat.com/electricpower
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The International System of Units (SI) is used in this publication.

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C175 PGBL
LEHE1808-09 (09/23)

TRUE NORTH

6.3m HIGH
14.5m dia.
DIESEL FUEL
TANK

NEW FUEL TANKS

CABLE TRAY FOR FUEL TANK CABLING SEE DETAIL "B" BELOW

BURIED CONDUITS (3 x 4") FOR FUEL TANK CABLING. MAINTAIN A MINIMUM 300mm [12"] SEPARATION BETWEEN BURIED PIPING AND CONDUIT

HOLD; DETAILS TBC

HOLD; DETAILS TBC

BURIED CONDUIT FOR INDIVIDUAL GENERATOR CABLE RUNS 1c500MCM/PH, TREFOILED

PLANT FOUNDATION OUTLINE

NEW BURIED FUEL PIPE

F E315-2

A E315-1

B E315-1

C E315-1

D E315-1

E E315-2

FD8 MODULE

FD9 MODULE

NEW DIESEL POWER PLANT (FD0)

GENSET REMOVAL ZONE

SWITCHGEAR MODULE

600V JUNCTION BOX FOR CONNECTION OF EMERG. BLACK-START GENSET. LOCATION TO BE FINALIZED BY FINNING

FUEL CABLING JUNCTION BOX DETAILS + LOCATION TBC

BURIED CONDUIT FOR ZIG-ZAG TRANSFORMER, 3c#2 (NOTE 3)

CONDUIT ORIGIN (0mm , 0mm) POINT; SOUTHEAST CORNER OF PLANT FOUNDATION SEE CONDUIT + STUB-UP SCHEDULE ON DWG. FD0-D-E310-2

ARC EXHAUST HAZARD AREA 10ft x 10ft (NOTE 2)

1200A RATED CABLE BUS FOR NEW FD0 GENERATING PLANT; SEE DETAIL "A" BELOW

600V STATION SERVICE POWER FROM NEW FD0-SST4 TO NEW FD0 GENERATING PLANT. CABLE TO BE ROUTED IN BURIED CONDUIT

CONTROL BUILDING

EXISTING TRAY LEADS TO FD1 CONTROL ROOM (continue 25M)

P2

P3

SST2

FIBER OPTIC + FIRE ALARM CABLE ROUTING

ROUTE FIBER OPTIC CABLE FROM FD0 TO EXISTING CONTROL TRAY TO 870S. ROUTE CABLE IN EXISTING TRAY TO RTU CABINET IN FD1 CONTROL ROOM.

TERMINATE FIBER CABLE IN PATCH PANEL; PATCH TO SCADA SWITCH #1

NEW FD0-SST4
500kVA, 24.94kV:600V
(NOTE 4)

P4

SST3

52-1
52-2
52-3
52-5

B(C)
Y(B)
A
R(A)

SEACAN

MAN DR

11.624

CABLE BUS ENTRY "TOP HAT" TO "CUSTOMER CONNECTION" SWITCHGEAR CELL AT FD0 POWER PLANT

TRAPEZE TYPE TRAY SUPPORT, CONNECTED TO MODULE CEILING

RISER TO S140 BUS

90° HORIZONTAL BEND (TYP.)

90° VERTICAL OUTSIDE BEND

RISER UP BUILDING

90° VERTICAL INSIDE BEND

90° VERTICAL INSIDE BEND

CABLE BUS SUPPORTS EATON DURA-BLOK DB630, SITTING ON PREPARED GROUND (TYP.)

3.048m [10ft] (NOTE 1)

1200A RATED ENGINEERED CABLE BUS 15.5"W x 8"H (TYP.)

DETAIL A
SCALE: 1:100
E310-1

CABLE BUS ROUTING DETAILS

PROPOSED CABLE TRAY (6"W) ROUTING FOR FUEL TANK CABLING. TRAY ROUTING TO BE FIELD-FIT ONSITE DEPENDING ON FUEL TANK CONTROL JUNCTION BOX LOCATION & INSTALLED FUEL LINES

NEW FUEL TANK

NEW FUEL TANK

ASSUMED CONTROL JUNCTION POINTS; TO BE FINALIZED BY MECHANICAL, OR FIELD-FIT ONSITE

3.048m [10ft] (TYP.)

EXISTING SUMP; TO BE MAINTAINED FOR RENTAL GENERATOR FUEL FEEDS

CABLE TRAY SUPPORTS EATON DURA-BLOK DB10 SITTING ON PREPARED GROUND (TYP.)

EXISTING FUEL LINE; TO BE MAINTAINED FOR RENTAL GENERATOR FUEL FEEDS

DETAIL B
SCALE: 1:100
E310-1

FUEL SYSTEM CABLE TRAY DETAILS

REFERENCE DRAWINGS

DWG. NO.	DRAWING TITLE
FD0-D-E310-2	ELECTRICAL SITE PLAN CONDUIT SCHEDULE
FD0-D-E315-1	FD8/FD9 ELECTRICAL SECTION VIEWS (SHT. 1)
FD0-D-E315-2	FD8/FD9 ELECTRICAL SECTION VIEWS (SHT. 2)

NOTES

1. CABLE BUS SUPPORT SPANS SHOWN AS 3.048m [10ft]. MAXIMUM SUPPORT SPAN ON STRAIGHT RUNS SHOULD NOT EXCEED 3.65m PER CABLE BUS MANUFACTURER RECOMMENDATIONS.
2. A 10ft x 10ft SQUARE AROUND THE ARC EXHAUST POINT OF THE FD0 SWITCHGEAR MODULE SHALL BE MARKED WITH CURBSTONES (OR SIMILAR) AND WITH APPROPRIATE SIGNAGE PLACED ON THE WALL OF THE SWITCHGEAR MODULE UNDERNEATH THE ARC EXHAUST POINT TO WARN PERSONNEL TO AVOID ENTERING THE AREA. DETAILS OF THE MARKING & SIGNAGE ARE TO BE FINALIZED BY WILDSTONE.
3. CONDUIT FOR ZIG-ZAG TRANSFORMER TO STUB-UP THROUGH FLOOR OPENING SHOWN. CABLE WILL BE ROUTED IN CONDUIT/TRAY FROM STUB-UP INTO ZIG-ZAG TRANSFORMER. DETAILS TO BE FINALIZED AND COORDINATED WITH FINNING.
4. LOCATION OF FD0-SST4 HAS BEEN SHIFTED SOUTH PER YEC COMMENTS; CONDUIT + TRANSFORMER VAULT INSTALLATION AND EXACT LOCATION TO BE FIELD-FIT ONSITE.
5. FOR CABLE BUS SECTION VIEW DRAWINGS, PLEASE REFER TO MPHUSKY CABLE BUS DRAWING PACKAGE.
6. RENTAL GENERATOR EQUIPMENT LOCATIONS AND CABLE ROUTING NOT SHOWN.

ISSUED FOR CONSTRUCTION
(BELOW GRADE ONLY)

StruthersTECH
#3 - 1101 Main Street, Penticton, BC, V2A 5E6
www.strutherstech.com

REV.	DATE	DESCRIPTION	BY	DES.	APP.
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STRUTHERS TECHNICAL SOLUTIONS LTD.
SIGNATURE Ryan Bentley
Date May 26, 2023
PERMIT NUMBER PP482
Association of Professional Engineers of Yukon

ENGINEERS STAMP

PROFESSIONAL ENGINEER YUKON R. M. BENTLEY TERRITORY
May 26, 2023

YUKON ENERGY CORPORATION

THERMAL REPLACEMENT PROJECT

CHECKED BY B. STAHL
DATE MAY 26/23
DRAWN BY R. BENTLEY
SCALE 1:167 A1

FARO DIESEL PLANT
FD8 & FD9
ELECTRICAL SITE PLAN

FD0-D-E310-1

REV. 0

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