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1 Purpose

This information document supports section 304.2 of the ISO rules, *Electric Motor Start Requirements*. The purpose of this information document is to provide additional information for the application of section 304.2. This information document is likely of most interest to operators in the Empress area, parties affected by both the Edson Gas Storage industrial complex and Shell Limestone industrial complex electric motor starts, and the operators of the transmission facilities that include the Bickerdike, Benbow and Marlboro substations.

2 Related Authoritative Documents

The AESO's authoritative documents consist of the ISO rules, the ISO tariff and the reliability standards. Authoritative documents contain binding rights, requirements and obligations for market participants and the AESO. Market participants and the AESO are required to comply with provisions set out in authoritative documents.

Market participants are encouraged to review the authoritative document related to this information document including:

Section 304.2 of the ISO rules, *Motor Start Approval Requirements*.

3 Approach to Rule Language

In creating section 304.2, the AESO has considered three (3) separate areas of the interconnected electrical system in which certain electric motor starts require special permission or consideration. There exist some provisions and conditions which are common to all these areas and are unlikely to change in the near future. Additionally, each area may have specific requirements to allow electric motor starts, based on operational studies. The AESO may modify these conditions as changes are made to the interconnected electric system and new operational studies are performed.

The AESO has determined that given the features of these requirements, the most appropriate format for section 304.2 is for the common provisions to exist in a general section of the ISO rule that governs electric motor starts in all these areas. Area-specific requirements are contained in Appendix 1 of section 304.2 to allow for possible changes as operational studies are performed that may change these requirements in a specific area.

4 Area-Specific Background Information

4.1 Electric Motor Start Requirements in the Empress Area

Multiple electric motors twenty five thousand horse power (25 000 hp) or larger, exist in the Empress area. With the exception of the Sand Hills electric motor, electric motor starts in the Empress area are not considered to be an issue when transmission system serving the area is operating with all elements in service and both Sheerness Plant generating units are on-line. However, simultaneous starts of large electric motors could result in low voltage in the Empress area. To avoid two (2) or more large electric

motors starting at once, the AESO must coordinate the starting of all electric motors twenty five thousand horsepower (25 000 hp) or larger as outlined in section 302.4. The intent is to delay electric motor starts only for the time required to avoid simultaneous starts.

4.2 Electric Motor Start Requirements for Shell Limestone

The Shell Limestone eighteen thousand horsepower (18 000 hp) synchronous electric motor is vital to the operation of the Shell Canada Limited (“Shell”) gas field and is normally in operation. The electric motor is normally started with a variable frequency drive. However, Shell has requested that under emergency conditions, when the electric motor is offline and the variable frequency drive is unavailable, the electric motor be permitted to start by direct connection to the AltaLink transmission system (across-the-line start).

The other loads in the Shell Limestone industrial complex area (see Appendix 4) comprise twenty five (25) kV loads that are fed from the same one hundred and thirty eight (138) kV 304S Shell Limestone substation, and some other low voltage industrial complex loads that are fed from the one hundred and thirty eight (138) kV Shell Limestone system. If the main eighteen thousand horsepower (18 000 hp) compressor is shut down, most of the twenty five (25) kV loads will also be shut off, and Shell is confident that the low voltage power plant loads which remain will not be significantly affected by the reduced voltages expected.

The across-the-line start tests performed by Shell of the eighteen thousand horsepower (18 000 hp) electric motor produced no negative effects on neighbouring loads (See Appendix 2) despite exceeding the AESO voltage flicker limits. Shell, Fortis Alberta and the AESO had agreed to the tests.

4.3 Electric Motor Start Requirements for Marlboro

348S Marlboro substation supplies the TransCanada load, and is fed by a T-tap connection on bulk transmission line 854L between 39S Bickerdike substation and 397S Benbow substation; see Appendix 4. TransCanada has installed five (5) five thousand horsepower (5 000 hp) electric motor-driven compressors with a total expected load of twenty four (24) MW at the Edson Gas Storage industrial complex, with the provision to add additional electric motors in the future. TransCanada has installed an autotransformer on each electric motor, initially in the sixty five percent (65%) tap position to reduce the voltage flicker when 348S Marlboro substation is fed only from 397S Benbow substation. During normal electrical supply conditions, the flicker level is expected to be about zero point eight six percent (0.86%). The maximum number of electric motor starts within an hour would range from three (3) to five (5), while the gas storage operation changes from injection to withdrawal electric mode.

5 Appendices

Appendix 1: Empress Area Market Participants Receiving Service Under Rate DTS

Appendix 2: Shell Limestone Affected Market Participants

Appendix 3: Empress Area Schematic

Appendix 4: Caroline/ Limestone Area Schematic

Appendix 5: Hinton/Edson Area Schematic

Revision History

Version	Effective Date	Description of Changes
1.0		Initial version

Appendix 1: Empress Area Market Participants receiving Rate DTS

The following is a list of market participants receiving service under Rate DTS of the ISO tariff in the Empress area:

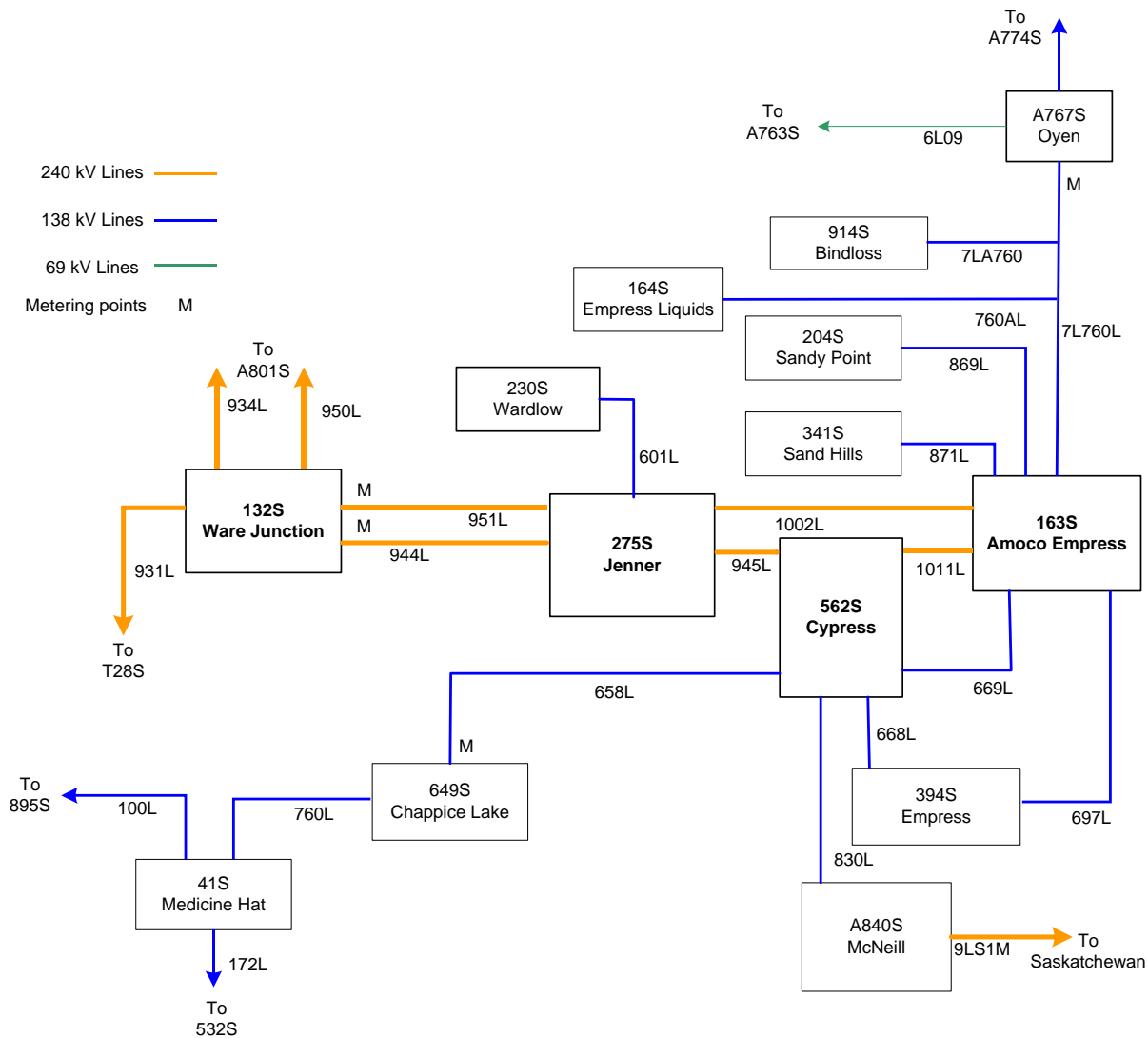
Substation (point of delivery)	DTS Customer	Operational Contact Personnel
275S Jenner	FortisAlberta	AltaLink South Transmission (speed dial)
164S Empress Liquid		
204S Sandy Point		
163S Amoco Empress/ 341S Sand Hills		
394S Empress		
394S Empress	Provident Energy	Provident Energy Control
163S Amoco Empress	Foothills Pipeline	BP Empress Control
230S Wardlow	Kinder Morgan Canada	Express Pipeline Control Centre
914S Bindloss	ATCO Electric	ATCO Electric System Control Centre

Appendix 2: Shell Limestone Affected Market Participants

The following is a list of **market participants** served from the 581S Amoco Ricinus substation that may experience voltage excursions during starts of the eighteen thousand horsepower (18 000 hp) electric motor located at the Shell Limestone industrial complex:

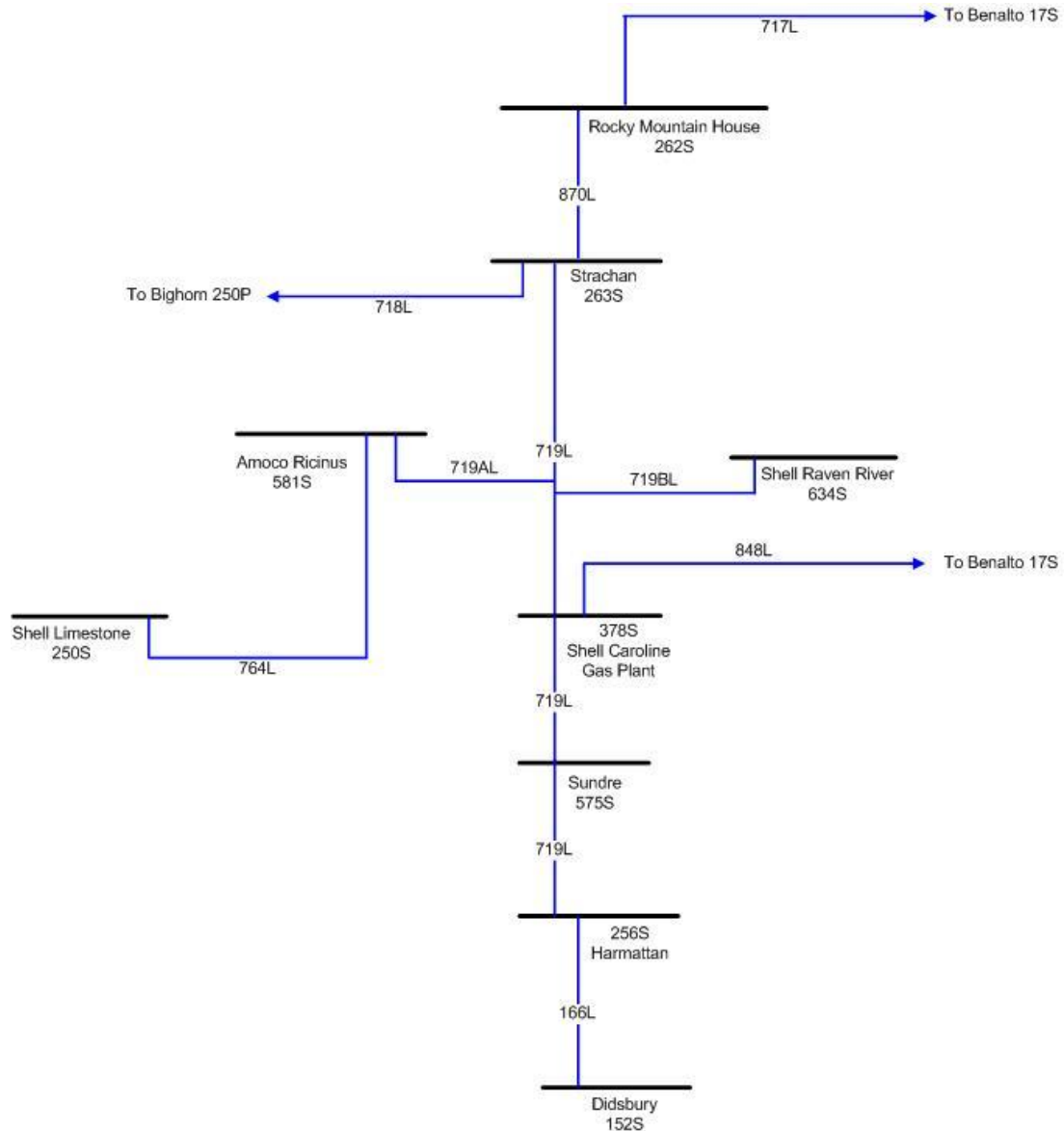
- (a) BP Ricinus Gas Plant; and
- (b) Mountain Air Lodge.

Appendix 3: Empress Area Schematic



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Appendix 4: Caroline/Limestone Area Schematic



Legend



Appendix 5: Hinton/Edson Area Schematic

