



Shell Canada Limited

Scotford Industrial System Designation Amendment

September 23, 2014



The Alberta Utilities Commission

Decision 2014-274: Shell Canada Limited
Scotford Industrial System Designation Amendment
Application No. 1610447
Proceeding No. 3157

September 23, 2014

Published by

The Alberta Utilities Commission
Fifth Avenue Place, Fourth Floor, 425 First Street S.W.
Calgary, Alberta
T2P 3L8

Telephone: 403-592-8845
Fax: 403-592-4406

Website: www.auc.ab.ca

1 Introduction

1. In this decision, the Alberta Utilities Commission (AUC or the Commission) must decide whether to approve Application No. 1610447 filed by Shell Canada Limited (Shell) on April 2, 2014, for an amendment to the Scotford industrial system designation (ISD). The Commission considered the application under Proceeding No. 3157.
2. Shell applied to include three separate projects within the industrial system designation: the addition of a hydrogen gas production facility, a CO₂ sequestration facility and a refinery debottlenecking project.
3. The Commission issued information requests to Shell on April 29, 2014, and September 8, 2014. Shell responded to the Commission's information requests on May 23, 2014, and September 9, 2014, respectively.

2 Background

4. The Scotford industrial complex is located in Strathcona County near Fort Saskatchewan and has been designated as an industrial system since 1999. The complex has expanded throughout the years and the most current approval of the ISD is Order No. [U2008-251](#).¹
5. The ISD was obtained by Shell, Shell Canada Products Ltd. (SCPL), Shell Chemicals Canada Ltd. (SCCL), Air Liquide Canada Ltd. (ALC), ATCO Power Canada Ltd. (ATCO Power) and ATCO Energy Solutions (AES). The Scotford industrial complex processes diluted bitumen and produces high-quality synthetic crude oils in a highly integrated industrial operation combining upgrading, refining, and petrochemical processes. There are six processes on-site, including the Upgrader, Upgrader Expansion, Refinery, ALC air separation plant, and two SCCL petrochemical facilities.
6. The Scotford industrial complex also includes, as stated in Order No. U2008-251, the following major electric facilities:
 - The ALC 84-megawatt (MW) gas turbine generator complete with unit transformer and heat recovery steam generator.
 - The ALC substation that includes three transformers and six 138-kilovolt (kV) circuit breakers.

¹ Industrial System Designation Order No. U2008-251, Application No. 1574565, August 1, 2008.

- The ATCO Power 83-MW Upgrader gas-turbine generator complete with unit transformer and heat recovery steam generator.
- The ATCO Power 87-MW upgrader steam-turbine generator complete with unit transformer.
- The ATCO Energy Solutions upgrader substation that includes three 138-kV circuit breakers and two 138/34.5-kV transformers.
- The AES upgrader expansion substation that includes five 138-kV circuit breakers and two 138/34.5-kV transformers.
- The AES 138-kV transmission loop connecting the ALC substation, the upgrader substation, the upgrader expansion substation, and 409S substation, which is owned by AltaLink Management Ltd (AltaLink).
- The Shell 18-MW upgrader expansion steam-turbine generator.
- Distribution facilities and equipment of less than 60 kV serving the Scotford industrial site.

3 Discussion

7. The Scotford industrial complex is expanding again and Shell has applied, on behalf of itself and the other ISD-designated companies, for an amendment to ISD Order No. U2008-251 to include the proposed expansions and the electrical facilities associated with the expansions. In particular, the expansions entail the addition of a hydrogen plant, CO₂ sequestration facilities and implementation of a debottlenecking project in the refinery. The following paragraphs describe these new facilities in greater detail.

8. Shell stated that it has contracted with Air Products Ltd. (APL) to build a hydrogen gas production facility, on Shell's lands adjacent to the Scotford industrial complex, that would be integrated with the refinery and upgrader and would be operated to meet Shell's requirements. Shell would provide APL with low-pressure boiler feed water and electricity and APL would provide Shell with high-pressure steam and hydrogen gas. Surplus hydrogen production, anticipated to be about 25 per cent of the total production, would be sold to third party industrial customers. Shell proposed a three kilometre double-circuit 34.5-kV line, from the existing Shell upgrader 34.5 kV substation, to supply electric energy to APL's hydrogen plant.

9. The CO₂ sequestration facilities would capture CO₂ gas from the upgrader and compress it to a liquid, which would be piped for sale or deep aquifer injection. The CO₂ compressor and associated equipment would have an operating load of about 20 MW, which would be supplied from the existing upgrader 34.5-kV distribution network. Transformers in the AES upgrader 879S substation would need to be replaced with larger units to accommodate this load growth. Shell stated that the project would be fully integrated and lie within the existing Shell upgrader footprint and would be owned by Shell Canada Ltd.

10. Shell also planned on debottlenecking the hydro-cracker unit within the Refinery to increase the overall through put and efficiency. The project would require an estimated nine-MW load. In order to accommodate the load increase, the redundant transformers in the AltaLink 409S substation would need to be replaced with larger units or a third transformer would need to

be added. The proposed equipment to be added for the debottlenecking project would be fully integrated and lie within the existing Shell refinery footprint.

11. Shell indicated that all of the electrical equipment required to provide electricity to the three expansion projects would be at 34.5 kV or 25 kV, and therefore under the 60-kV distribution equipment definition in Order No. U2008-251. Therefore, Shell requested that the proposed additional distribution assets, less than 60 kV, continue to be included under the ISD, as is the case under Order No. U2008-251.

12. In the information responses, dated May 23, 2014, Shell indicated that in working with the Alberta Electric System Operator and AltaLink on the refinery debottlenecking project, Shell accepted a proposal to have a third transformer installed within the 409S substation. AltaLink would subsequently file an application with the AUC to amend the substation licence.

13. In Shell's information responses it indicated that the participant involvement program for the hydrogen production facility portion of the application would not be completed until the end of July 2014. In a letter, dated June 30, 2014, Shell submitted that the participant involvement program would not be completed until August 31, 2014.

14. On August 15, 2014, Shell requested that the Commission address the CO₂ sequestration facility separately in order to commence construction of the CO₂ sequestration project before November 1, 2014. The Commission is therefore considering only the CO₂ sequestration project in this decision.

15. Shell submitted that the CO₂ sequestration project would require the replacement of the two existing 54/72/90-megavolt-ampere (MVA), 138/34.5- kV transformers with two 90/120/150-MVA, 138/34.5-kV transformers as well as the addition of two 35-kV air core reactors and associated switches and equipment required to accommodate the increased load within the Scotford 879S substation.

16. Shell submitted a noise impact summary form respecting the change in capability of the transformers to be added to the 879S substation and stated that the anticipated noise levels would remain within the permissible sound levels specified in AUC Rule 012: *Noise Control* (AUC Rule 012).

17. Shell submitted that the notification packages for the CO₂ sequestration project were mailed to all occupants, residents and landowners within 800 metres of the substation site. No concerns were received with respect to the project.

4 Findings

18. The Commission finds that the application regarding the CO₂ sequestration project meets the information requirements stipulated in AUC Rule 007: *Applications for Power Plants, Substations, Transmission Lines and Industrial System Designations and Hydro Development*.

19. The Commission also finds that the noise impact assessment summary form submitted by Shell fulfills the requirements of AUC Rule 012 and the anticipated noise emissions associated with the replacement of the transformers at the CO₂ sequestration facility will not exceed the permissible sound level.

20. The Commission finds that Shell's participant involvement program has been satisfactory with respect to the CO₂ sequestration portion of the project and there are no public, industry or agency objections or concerns.

21. Due to the minor nature of the application, the Commission finds that the replacement of two transformers within the ISD site are not likely to cause any adverse environmental effects.

22. A notice of application was not issued for the ISD amendment, and therefore a hearing was not required as the Commission considered that its decision or order would not directly and adversely affect the rights of a person pursuant to Section 9 of the *Alberta Utilities Commission Act*.

23. The Commission considers that the Scotford site has been designated as an ISD since 1999 and the amendment application is a minor alteration, There is no indication that the principles and criteria of Section 4 of the *Hydro and Electric Energy Act* will not continue to be satisfied.

24. Having considered all of the evidence before it, the Commission finds the proposed work at the ISD to be in the public interest pursuant to Section 17 of the *Alberta Utilities Commission Act*, having given consideration to the environmental, economic and social effects of the proposed work.

5 Decision

25. Pursuant to Section 4 of the *Hydro and Electric Energy Act* and sections 2(1)(d) and 117 of the *Electric Utilities Act*, the Commission approves the industrial system designation amendment and grants Shell the order set out in Appendix 1 – Order No. U2014-402 – September 23, 2014 (Appendix 1 will be distributed separately).

Dated on September 23, 2014.

The Alberta Utilities Commission

(original signed by)

Tudor Beattie, QC
Commission Member