UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 8, 2016

LICENSEE: EXELON GENERATION COMPANY, LLC

FACILITIES: BYRON STATION, UNIT NOS. 1 AND 2

SUBJECT: SUMMARY OF DECEMBER 5, 2016, MEETING WITH EXELON GENERATION COMPANY, LLC REGARDING PLANNED LICENSE AMENDMENT REQUEST TO PRODUCE MOLYBDENUM-99 AT BYRON STATION, UNIT NOS. 1 AND 2 (CAC NOS. MF8258 AND MF8259)

On December 5, 2016, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Exelon Generation Company, LLC (Exelon, the licensee). The purpose of the meeting was to discuss Exelon's planned license amendment request (LAR) to permit the production of molybdenum-99 (Mo-99) at Byron Station (Byron), Unit Nos. 1 and 2. The meeting notice and agenda are available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML16337A256. A copy of Exelon's slides which were used at the meeting is available under ADAMS Accession No. ML16334A464. A list of attendees is enclosed.

Exelon plans to produce Mo-99 by neutron irradiation of nonradioactive Mo-98 targets in the Byron cores. The licensee also noted that it is considering using Braidwood Station, Units 1 and 2, as another possible site. Mo-99 has a half-life of approximately 66 hours and decays into Technicium-99m (Tc-99m), which has a half-life of approximately 6 hours. Tc-99m is a widely used diagnostic medical isotope which is currently in short supply. The licensee proposes to insert the Mo-98 targets into the Byron cores using the existing movable incore detector systems (MIDS). The MIDS is a nonsafety-related system used approximately every 120 days for calibration of the core monitors. The MIDS will be modified to support the Mo-99 production. Exelon stated it is also considering replacing its MIDS with a system that used fewer drives, which would allow more slots for Mo-99 production.

After approximately 7 days of irradiation, the targets will be removed from the core and placed in a licensed MIDUS Type B transportation container using an automated system. The approximately 750 pound container will then be removed from containment through the primary airlock. Exelon indicated that it has not decided how it will move the container through containment, and has not determined the extra dose to workers that would result from this activity. Exelon stated that the location where the container would be loaded is on the same elevation as the airlock. The licensee further stated that there is safety-related equipment under the floor grating, and that it would have to consider loading on the grating. The NRC staff suggested that the movement of the container through containment should be discussed in the LAR.

The transportation container with the irradiated Mo-98 targets will be transferred to NorthStar Medical Radioisotopes, which will be responsible for transportation from the site to a nearby offsite licensed processing center. NorthStar will be responsible for processing the material.

Exelon stated that as part of the LAR an additional sentence will need to be added to Byron's License Condition 2.B.(5) to indicate that mechanical disassembly of the fuel assembly instrument thimbles containing Mo-99 is not considered separation. The licensee also stated that an additional license condition was needed to permit it to intentionally produce, possess, receive, transfer, and use Mo-99.

Exelon stated that no changes to the Byron technical specifications (TSs) are required, the final safety analysis report (FSAR) does not need to be revised, and the safety analyses in FSAR Chapters 6 and 15 are not impacted. The NRC staff noted that the TSs are based on current plant operations, and the additional containment entry/exit for the proposed activity may not be bounded by the existing TSs. The staff suggested that the licensee should justify its position that the existing TSs are adequate, particularly for the additional containment entry/exits. In addition, the staff questioned why the FSAR would not need to be updated since the proposed activity is not currently described in the FSAR. The Exelon personnel agreed to consider justification for the current TSs and potential changes to the FSAR. Exelon also stated that environmental considerations will be included in the LAR.

The NRC staff also asked about the potential impacts to reactor physics since the Mo-98 targets would locally be absorbing neutrons within the reactor core. The licensee indicated it did not anticipate any changes to core physics as a result of the proposed amendment.

Exelon stated that the LAR would cover a proof of concepts demonstration using a small number of Mo-98 targets, as well as full scale commercial production. One of the national labs would likely be used to analyze the targets irradiated during the proof of concepts demonstration. The information from this analysis will then be used to obtain approval from the Food and Drug Administration, which is required before the Tc-99m can be used for medical applications.

The NRC staff asked if Exelon had considered any operating experience from reactors in other countries that produce Mo-99. Exelon stated that the process it will use is substantially different than what has been done elsewhere, such that the operating experience would not be applicable.

Two members of the public asked questions at the end of the meeting. One person was a member of the press who asked several questions to clarify statements made during the meeting. Another person asked questions regarding NRC regulation of Mo-98; the responsibilities of any waste generated from the proposed activity; and the NRC engagement with Canada regarding their reactor facilities which will cease production Mo-99 in March 2018.

Please direct any inquiries to Joel Wiebe at 301-415-6606 or Joel.Wiebe@nrc.gov.

Blake Purnell, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454 and STN 50-455

Enclosure:
List of Attendees

cc w/encl: Distribution via Listserv

LIST OF ATTENDEES

DECEMBER 5, 2016, MEETING

WITH

EXELON GENERATION COMPANY, LLC

Name	Affiliation
B. Purnell	NRC/NRR
M. Hamm	NRC/NRR
S. Lynch	NRC/NRR
J. McGhee	NRC/RIII
J. Draper	NRC/RIII
B. Bartlett	NRC/RIII
P. Pelke	NRC/RIII
D. Howe	NRC/NMSS
J. Cassidy	NRC/RIII
G. Edwards	NRC/RIII
H. Peterson	NRC/RIII
V. Mitlyng	NRC/OPA
C. Weber	NRC/NRO
S. Burnell	NRC/OPA
R. Haskell	NRC/NRR
W. Rautzen	NRC/NRR
M. Young	NRC/OGC
M. Reitmeyer	Exelon
N. Kruger	Exelon
L. Simpson	Exelon
C. Frank	Westinghouse
P. Khambatta	Westinghouse
J. Harvey	NorthStar
M. Heibel	Westinghouse
M. Semmler	Westinghouse
M. Simmons	Exelon
S. Dolly	Platts
T. Clements	Savannah River Site Watch

Enclosure

Please direct any inquiries to Joel Wiebe at 301-415-6606 or Joel.Wiebe@nrc.gov.

/RA/

Blake Purnell, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454 and STN 50-455

Enclosure:
List of Attendees

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC
RidsRgn3MailCenter Resource
RidsNrrPMByron Resource
RidsNrrDorl Resource
JBowen, EDO
RidsNrrDlrRerb Resource
MHamm, NRR
JDraper, RIII
DHowe, NMSS
HPeterson
SBurnell, OPA
MYoung, OGC
LPL3-2 R/F
RidsNrrDorlLpl3-2 Resource
RidsNrrLASRohrer Resource
TWertz, NRR
RidsOpaMail Resource
RidsNrrDraAphb Resource
SLynch, NRR
BBartlett, RIII
JCassidy, RIII
VMitlyng, OPA
RHaskell, NRR
RidsACRS_MailCTR Resource
RidsNrrPMExelon Resource
TClark, EDO
RidsRgn3DrpResource
RidsNrrDraArcb Resource
JMcGhee, RIII
PPelke, RIII
GEdwards, RIII
CWeber, NRO
WRautzen, NRR

ADAMS Accession No. Meeting Notice ML16337A256 Meeting Summary ML16342C385 Handouts ML16334A464

OFFICE	NRR/DORL/LPL3/PM	NRR/DORL/LPL3/LA	NRR/DORL/LPL3/BC	NRR/DORL/LPL3/PM
NAME	BPurnell	SRohrer	GEMiller	BPurnell
DATE	12/8/16	12/8/16	12/8/16	12/8/16

OFFICIAL RECORD COPY