UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
South Texas Project Nuclear Operating Co.
Application for the South Texas Project **Docket Nos. 52-012, 52-013**
Units 3 and 4
Combined Operating License

INTERVENORS' RESPONSE TO APPLICANT'S
MOTION TO DISMISS CONTENTIONS 8, 9, 14 AS MOOT

Introduction

Intervenors contend that Contentions 8, 9, and 14 have not been rendered moot by the Applicant's changes to the Environmental Report attached in their November 12th and November 24th letter to this Panel. Accordingly, the contentions should advance as admitted. Alternatively, in the case of Contention 8, Intervenors maintain that it should advance in a modified version as discussed *infra.*[1]

Contention 8

Contention 8 is not moot. The proposed revisions to the Applicant's Environmental Report either do not discuss the environmental impacts of accumulation of radioactive materials in the Main Cooling Reservoir (MCR) or do so in a way that fails to address the merits of the contention.

As admitted by this Panel Contention 8 reads as follows:

> The Environmental Report fails to analyze the environmental impacts associated with the increase in radionuclide concentration in the MCR due to the operation of STP Units 3 & 4.[2]

[1] This opposition to the Applicant's Motion to Dismiss Contentions 8, 9, and 14 is not a waiver of the Intervenor's opportunity to file any additional new contention(s) based the proposed amendments to the ER.
[2] Memorandum and Order, September 29, 2009, p. 7

The premise of Contention 8 is that operation of STP Units 3 & 4 will cause increases in radioactive material deposition into the MCR. The Applicant acknowledges as much by its recognition that, at a minimum, there will be increases in tritium and Cobalt-60 in the MCR attributable to Units 3 & 4.[3] Section 5.4.1 of the Environmental Report states that during plant operations radioactive liquids and gases would be discharged to the environment.[4] However, Cobalt-60 is expected to be discharged in particulate form as part of the liquid waste stream. The estimate of the radioactivity of the cobalt particulates is listed in the ER Table 3.5-1. However, the discussion regarding exposure pathways does not describe the environmental effects of increasing radioactive levels in the MCR. While the ER does discuss the quantities and forms of the increases of radioactivity in the MCR it does not discuss the environmental impacts thereof. Specifically, Cobalt-60 is described as a particulate that precipitates out of water and concentrates in the MCR sediments.[5] There is no discussion of the environmental effects of continued concentration of the particulates in the MCR sediment though the Applicant acknowledges such will occur.[6]

The Applicant offers that discharges of radioactive liquids from Units 3 & 4 will be less than Units 1 & 2. However, there is no quantification of the differences in discharges between Units 1 & 2 and Units 3 & 4. The Applicant simply represents that unspecified "more extensive and more efficient" liquid waste management systems (LWMS) may minimize discharges of radioactive liquid.[7] The LWMS description does not include any discussion of environmental impacts from the discharges.

[3] Notice Letter from Stephen J. Burdick, November 12, 2009, Attachment 3, p.1-2
[4] Id., p.1
[5] Notice letter, Attachment 3, p. 2
[6] The Applicant asserts that the MCR water level will remain at original design levels during operation of Units 3 & 4. Attachment 1, p.1,2. However, as recently as this past summer water levels in the MCR dropped to 36.3 feet MSL. (See attached STP newsletter) As MCR levels drop concentrations of contaminants increase. Because the Applicant assumes, incorrectly based on recent experience, that MCR levels will remain at optimal 49 feet MSL there is no attempt to account for water quality variations based on reduced MCR levels.
[7] Id.,p.1-2

The closest the Applicant comes to discussing environmental effects is to assert that since 1992 nuclides have not been detected in biological samples.[8] And while the Applicant asserts it does not anticipate that radionuclides will be detected in biological samples after the projected operation of Units 3 & 4 it offers no factual support for its position.[9] And this assertion is problematic on its face because of the Applicant's admission that Units 3 & 4 will add to the total radioactive burden of the MCR but with no corresponding environmental effects. Moreover, the Applicant does not argue that the particulate discharges from Units 1 & 2 have ceased or that Units 3 & 4 will not discharge radioactive particulates.[10]

The Applicant also attempts to minimize the impacts caused by the particulate discharges by suggesting that an equilibrium concentration for radionuclide concentrations be applied.[11] Dr. Lauren Ross has considered this argument and contends that it is faulty.[12] As Dr. Ross points out, the equilibrium analysis assumes uniform deposition of sediment and that mixing occurs within the top six inches of sediment. These two assumptions are unsupported by the Applicant. In contrast, Dr. Ross contends that estimates of radioactive concentration should be based on sediment deposition rates not on mixing rates.[13]

The Applicant asserts that currently there is no pathway from the reservoir for Cobalt-60 to cause exposures to people.[14] However, this is as close as the Applicant comes to describing the fate and transport of radioactive particulates discharged to the MCR. The Applicant also asserts that even if people were directly exposed to the radioactive sediment no health effect could be measured because the radioactive material is below detection levels.[15] However, this broad statement should be considered in the context of the accepted risks associated with Cobalt-60.[16]

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[8] Id., p.3
[9] Id.
[10] Cobalt-60 has been detected in nearly half of all sediment samples from 2003to 2007. Attachment, p. 2.
[11] Attachment 3, p.3
[12] Ross Letter Report, December 14, 2009
[13] Id.
[14] Attachment 3, p.3
[15] Id.
[16] According to the Environmental Protection Agency Cobalt-60 has adverse health effects. "All ionizing radiation, including that of cobalt-60, is known to cause cancer. Therefore, exposures to gamma radiation from cobalt-60 result

The Applicant does not describe the qualities of the Cobalt-60 in terms of dimensions or weight. Hence, measuring the health effects from exposures to Cobalt-60 without knowing the actual quantities discharged is not possible. The Applicant likewise assumes that the MCR is a confined water body for purposes of exposure effects. It asserts that since Cobalt-60 is not soluble it will not be carried into groundwater. However, that assumes that all Cobalt-60 migrates to and remains in sediment. The Applicant makes no attempt to determine whether Cobalt-60 laden sediment particles migrate to groundwater or surface water. There is simply an assumption by the Applicant that once discharged from the plant all Cobalt-60 will remain in-situ in sediment for the duration of its hazardous life.

The Applicant has not described the effects of gamma radiation from Cobalt-60 on living organisms in the MCR. Exposure to gamma radiation from Cobalt-60 has the potential to cause harm to biota in the sediment even if it is not specifically found in biological samples. Moreover, Cobalt-60 bioconcentrates in the environment.[17] The Applicant does not discuss bioconcentration or bioaccumulation of radionuclides in the MCR.

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in an increased risk of cancer. Because it emits such strong gamma rays, external exposure to cobalt-60 is also considered a significant threat. The magnitude of the health risk depends on the quantity of cobalt-60 involved and on exposure conditions: length of exposure, distance from the source (for external exposure), whether the cobalt-60 was ingested or inhaled." http://www.epa.gov/radiation/radionuclides/cobalt.html#affecthealth

The Argonne National Laboratory discusses Cobalt 60 as follows:
"Cobalt can be taken into the body by eating food, drinking water, or breathing air. Gastrointestinal absorption from food or water is the principal source of internally deposited cobalt in the general population. Estimates of the gastrointestinal absorption of cobalt range from 5 to 30%, depending on the chemical form and amount ingested; 10% is a typical value for adults and 30% for children. Cobalt is an essential element found in most body tissues, with the highest concentration in the liver. Vitamin B12 is a cobalt-containing vitamin essential for red blood cell formation in humans, and the intestinal absorption of cobalt in this vitamin is high. Fifty percent of cobalt that reaches the blood is excreted right away, mainly in urine; 5% deposits in the liver, and the remaining 45% deposits evenly in other tissues of the body. Of the cobalt that deposits in the liver and other tissues, 60% leaves the body with a biological half-life of 6 days and 20% clears with a biological half-life of 60 days; the last 20% is retained much longer, with a biological half-life of 800 days. On the basis of animal studies, retention of cobalt was determined to be the same for all age groups. Inhaled cobalt oxide moves from the lung to body tissues quite readily. Cobalt-60 poses both an internal and external hazard, and the main health concern is associated with the increased likelihood of cancer. External exposure is a concern because of the strong external gamma radiation, and shielding is often needed to handle wastes and other materials with high concentrations of this isotope. Inside the body, cobalt presents a hazard from both beta and gamma radiation." http://www.ead.anl.gov/pub/doc/Cobalt.pdf

[17] Coleman, et al., *Zinc and Cobalt Bioconcentration and Tox*icity, 132(2), 102-109 (1971)(plant species studied all bioaccumulated Cobalt to a point that such might cause toxicity in food chain. http://www.jstor.org/pss/2474045

The Applicant's approach is to describe what means it will use to control discharges to the MCR but there is scant discussion of the actual effects of the discharges. The Applicant has not discussed the actual physical changes to the environment that are the consequences of discharging radioactive particulates into the MCR. *Sabine River Auth. V. U.S. Dept. of Interior*, 745 F.Supp. 388, 394 (E.D.Tex. 1990), citing *Metropolitan Edison Co. v. People Against Nuclear Energy*, 466 U.S. 766, 774 (1983) (significant impact caused by change in physical environment requires analysis under NEPA).

The Applicant also dismisses environmental effects of tritium by noting it does not concentrate in the environment.[18] However, this overlooks that organically bound tritium remains in the body longer than tritiated water.[19] Additionally, the Applicant does not acknowledge adverse health effects of tritium exposures.[20]

The Intervenors maintain that Contention 8 is not moot. Alternatively, the contention should advance to adjudication in a modified version based on the omission of discussion by Applicant of the actual environmental impacts, including bioaccumulation and bioconcentration, anticipated from radioactive particulates and tritium discharged into the MCR.

See also: *Bioaccumulation and Bioconcentration Screening,* p. 3 (identifies Cobalt as likely to bioaccumulate and bioconcentrate in water), http://www.srs.gov/general/programs/soil/ffa/rdh/p74.PDF and Cummins, Radiological Bioconcentration Factors for Aquatic,Terrestrial, and Wetland Ecosystems at the Savannah River Site (U), pp.23-24, http://www.srs.gov/general/programs/soil/ffa/rdh/p74.PDF

[18] Attachment 2, p.4

[19] Hunt *et al* 2009 *J. Radiol. Prot.* 29 23-36

According to the EPA organically bound tritium remains in the body longer than tritiated water. "Tritium is almost always found as water, or "tritiated" water. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted through the urine within a month or so after ingestion. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period." http://www.epa.gov/radiation/radionuclides/tritium.html

[20] "As with all ionizing radiation, exposure to tritium increases the risk of developing cancer. However, because it emits very low energy radiation and leaves the body relatively quickly, for a given amount of activity ingested, tritium is one of the least dangerous radionuclides. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues are generally uniform and dependent on the tissues' water content." Id.

Contention 9

Contention 9 is not moot. The proposed revisions to the Applicant's Environmental Report either do not discuss the environmental impacts of increased tritium concentrations in groundwater or do so in a way that fails to address the merits of the contention.

Contention 9 was admitted by this Panel and reads as follows:

> The Environmental Report fails to predict or evaluate the effects of increasing groundwater tritium concentrations.[21]

Intervenors incorporate by reference the arguments and authorities regarding tritium from Contention 8, *supra.* The Applicant has not discussed the environmental effects of increasing tritium concentrations. Its descriptions of discharge amounts do not address the impacts to biota or humans from increasing tritium levels in the MCR, or in other surface water or groundwater.

Contention 14

Contention 14 is not moot. The proposed revisions to the Applicant's Environmental Report either do not discuss the environmental impacts of unregulated seepage from the MCR into the adjacent shallow groundwater or do so in a way that fails to address the merits of the contention.

As admitted by this Panel Contention 14 reads as follows:

> The Environmental Report fails to analyze adequately the environmental impacts of unregulated seepage from the MCR into the adjacent shallow groundwater. [22]

Intervenors contend that the Environmental Report as amended still fails to adequately analyze the environmental impacts of unregulated seepage from the MCR into the adjacent shallow groundwater. Applicant asserts that because TPDES Permit No. WQ0001908000 "regulates the outfalls that discharge to the MCR," this "assures that necessary treatment and monitoring for nonradioactive contaminants

[21] Memorandum and Order, September 29, 2009, p. 7
[22] Memorandum and Order, September 29, 2009, p. 25, 31

occurs before discharge to the MCR."[23] Regulation of contaminants entering the MCR does not constitute an analysis of the environmental effects of unregulated seepage from the MCR into groundwater. The Applicant's approach is to describe what means it would use to control discharges to the MCR but there is very little discussion of the actual impacts of the unregulated seepage. In support of this position Intervenors incorporate by reference the arguments and authorities herein regarding Contention 8 concerning radioactive particulate and tritium discharges.

Contention 14 should advance as admitted.

Accordingly, Intervenors urge this Panel to deny the Applicant's Motion to Dismiss Contentions 8, 9 and 14 As Moot. Alternatively, Contention 8 should advance as modified.

Respectfully submitted,

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[23] Attachment 2, p. 1

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CERTIFICATE OF SERVICE

I hereby certify that on December 14, 2009 a copy of "Intervenors' Response to Applicant's Motion to Dismiss Contentions 8, 9, & 14 as Moot" was served by the Electronic Information Exchange on the following recipients:

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Make-up pumps raise level

After a lengthy decline to nearly a record low during the summer drought, the water level in the reservoir has risen significantly in just two months.

The level dropped to 36.3 feet Mean Sea Level (MSL) in early September, barely above the historic low of 36.2 feet MSL set in October 2000. The reservoir's depth had steadily decreased for more than two years, from a record of approximately 48 feet MSL in July 2007.

"If the level had fallen just a few more inches to below 36 feet MSL, we would have had to replenish the reservoir by pumping fairly brackish water under our contract Water Delivery Plan," Environmental Manager Sandy Dannhardt said.

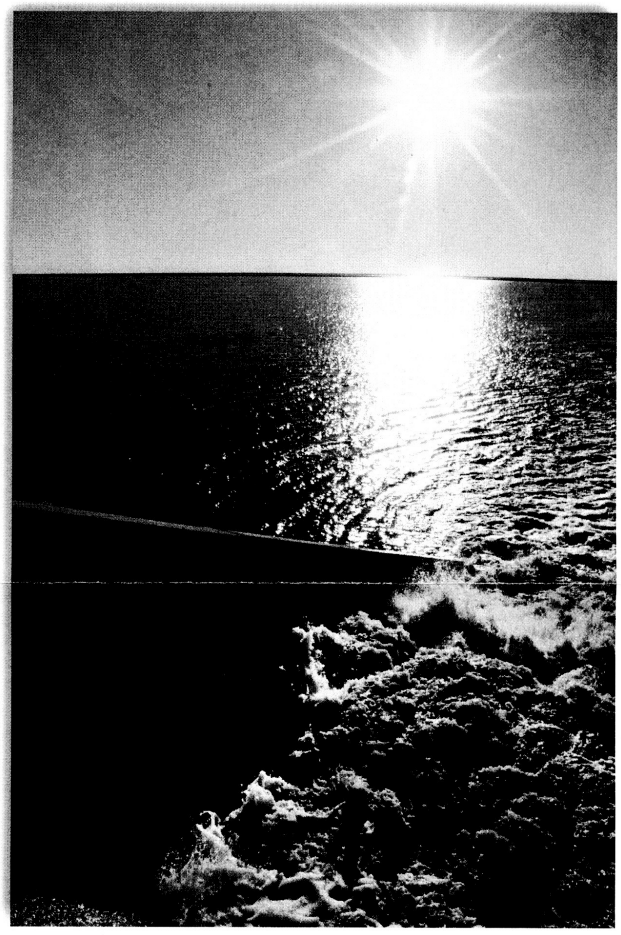
However coastal and upstream rains in September and October increased the volume and flow of the Colorado River, enabling STP to pump fresh water into the reservoir. With three of the four reservoir make-up pumps operational, capable of pumping 540 cubic feet per second (242,369 gpm), the reservoir level is rising quickly.

"How much we pump and how long we pump depends on the river's flow rate and corresponding water quality," Dannhardt said.

The flow rate was good enough in September for STP Operations personnel to run the pumps up to 24 hours a day for 12 days. They pumped nearly 5,000 acre-feet of water that month, raising the level of the 7,000-acre reservoir nearly a foot.

Heavy rains last month kept the pumps running 25 of the 31 days. The pumps operated around-the-clock on 16 of those days, drawing in 1,070 acre-feet each day and raising the reservoir level approximately a foot each week. More than 21,000 acre-feet of water was pumped into the reservoir in October, increasing the level to 40 feet MSL.

"Whenever the flow rate is sufficient, Operations will keep running the pumps," Dannhardt said. "We'd like to get the level back to 47 feet, which is considered optimal."



The reservoir make-up pumps deliver water from the Colorado River at a rate of 242,369 gallons per minute. At that rate, an average size swimming pool would fill in just six seconds. The reservoir is now at 40 feet MSL (Mean Sea Level).

Issues with head lifting device resolved

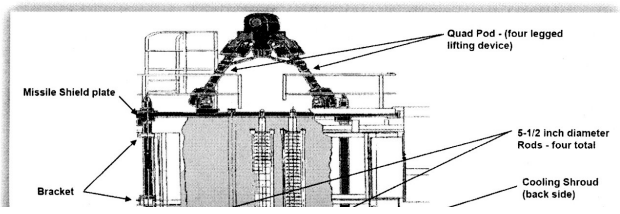
As we continue down the critical path of head installation, we are always diligent and careful to make sure the job is performed right the first time.

The head lifting device consists of three parts - the quad-pod, the missile shield plate, and the four lift rods. During this latest evolution, we had to overcome the issue of attaching the lift rods to the new head.

While attempting to re-insert two of the four lift rods into the threaded lifting 'bosses' on the replacement head, two out of the four lift rods would not fit as designed due to an obstruction with the cooling shroud.

We first noticed an issue with the lift rod when we observed threads that appeared to be split. This condition was promptly repaired by our PCI machinists.

A second issue came up after a gauging process when the gauging tool got stuck. The result again was damage to the rod threads. Our own STP mechanical teammates Terry Brewer and Al Plunkett took care of business and repaired the threads.



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