

**Florida  
Power**  
CORPORATION  
Crystal River Unit 3  
Docket No. 50-302

October 23, 1995  
3F1095-09

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

Subject: Revised Operator Actions for Postulated Sulfur Dioxide Tank Rupture

Reference: 1. FPC to NRC letter, 3F0588-10, dated May 23, 1988  
2. NRC to FPC letter, 3N0589-25, dated May 25, 1989

Dear Sir:

Florida Power Corporation (FPC) is submitting this letter to advise the NRC that FPC is clarifying the commitment for use of self-contained breathing apparatus (SCBA) by Crystal River Unit 3 (CR-3) control room operators during an event involving toxic gas. FPC will no longer require operators to immediately don the SCBAs. Previously, FPC required the control room operators to put on their SCBAs as the first immediate action if the control complex is not in the recirculation mode and AP-513 is entered. AP-513 is the abnormal procedure for toxic gas events. FPC instructions for donning the SCBAs were invoked to assure that operators would be available to control the plant in the event of a rupture of the sulfur dioxide (SO<sub>2</sub>) tank located at Crystal River Unit 1 (CR-1), which is located adjacent to the nuclear unit. FPC has decreased the maximum amount of SO<sub>2</sub> stored in the tank permanently to 30 tons or less. This reduction reduces the potential maximum concentration of SO<sub>2</sub> gas in the control room following a postulated tank rupture to less than 36 ppm which is the toxic gas Protection Action Limit (PAL) for CR-3. The justification for this clarification is provided in the subsequent sections of this letter.

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CRYSTAL RIVER ENERGY COMPLEX: 15760 W. Power Line St • Crystal River, Florida 34428-6708 • (904) 795-6486  
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## BACKGROUND

The licensing basis for CR-3 is defined by the reference letters. Reference 1 is a response to NRC questions about CR-3 toxic gas protection. Reference 2 is the NRC's safety evaluation report (SER) on the CR-3 control room habitability issue.

In Reference 1, FPC discussed the fact that industry toxicity limits for short term exposure to  $\text{SO}_2$  were between 120 and 125 ppm. Our position is that continued operation of plants with  $\text{SO}_2$  concentrations in this range are acceptable provided an operator is placing his SCBA into operation within 2 minutes. FPC goes on to state that we investigated additional toxicity data sources. The literature search indicated that a limit of 30% of the  $\text{RD}_{50}$  value (where  $\text{RD}_{50}$  is the concentration of a sensory irritant at which a 50% decrease in respiratory rate occurs, i.e. 120 ppm for  $\text{SO}_2$ ) should be established as the Emergency Exposure Limit (EEL). The EEL for a short-term exposure to an airborne contaminant is a concentration when inhaled for a specified, brief period rare in the lifetime of an individual is believed not to result in a period of disability or interference with the performance of his assigned task. This EEL definition more correctly describes the exposure for which the NRC suggested a Protection Action Limit (PAL) be established. Standard Review Plan (SRP) 6.4, "Control Room Habitability System," which FPC committed to follow as a guideline only, defines the PAL as a limit that will assure that the operators will quickly recover after breathing apparatus is in place.

Based on these considerations, FPC committed to 36 ppm as the Protection Action Limit for CR-3. If the control room  $\text{SO}_2$  concentration were expected to be equal to or greater than the PAL, an operator who was exposed to this concentration for 2 minutes or less should quickly recover after SCBAs are in place. Application of this commitment meant that with a 36 ppm PAL, FPC established the actions to be taken for a  $\text{SO}_2$  rupture which were to don the SCBAs immediately.

Reference 2 is silent about the 2 minute SCBA actions, but it does accept 36 ppm as the PAL for CR-3 to afford some operator protection. Therefore, it is reasonable to assume that the NRC views the SCBAs as being necessary if the concentration were to go above 36 ppm. In that case, the previous actions were appropriate.

In previous  $\text{SO}_2$  analyses with the tank loaded to its capacity of 40 tons, a postulated rupture could produce a control room  $\text{SO}_2$  concentration of 38.2 ppm within 2 minutes, utilizing only the local detector installed in the control room ductwork (there are detectors at the tank, but they are not assumed to be available for this scenario). Since this concentration was above the 36 ppm PAL, FPC took credit for operators donning SCBAs within 2 minutes to allow them to continue to take mitigative actions. This commitment formed the basis for plant operating instructions which directed the operators to don their SCBAs immediately upon any indication of a toxic gas event.

#### REVISED COMMITMENT

The SO<sub>2</sub> tank at CR-1 has been a source of problems for CR-3 for many years. There have been occasions where minor leaks during the transfer of SO<sub>2</sub> from the delivery truck to the tank caused toxic gas actuations to occur at CR-3. While these leaks did not pose a problem for CR-3, they were an inconvenience and resulted in a burden for the operators. Because of such long standing operational difficulties with the tank, FPC has decided to limit the quantity of SO<sub>2</sub> actually stored in the tank. The tank is now limited to a maximum of 30 tons. This limit is being implemented in two steps. FPC's Fossil Operations have been directed to maintain the tank below 30 tons by (1) red tagging the fill valve to the CR-1 Fossil Shift Supervisor with instructions to advise the CR-3 Nuclear Shift Supervisor of any activities related to filling/drainning the tank and (2) modifying the tank to limit SO<sub>2</sub> capacity to 30 tons. Until the modification is completed in 1996, FPC has directed that the tank not be filled above the 30 ton limit. Presently, the tank has less than 20 tons in it. FPC's intent is to generally decrease the contents over the next year so that the tank will be very close to being empty when the modifications are made.

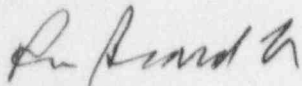
Based on these changes in SO<sub>2</sub> tank operating limits, FPC revised the SO<sub>2</sub> analyses for a maximum tank capacity of 30 tons. The analyses show that assuming the same worst case rupture scenario, the control room concentration reaches a peak of 29 ppm as the control room is isolated by the intake detector. Since this concentration is below the PAL, it is not necessary to assume the operators are donning SCBAs within 2 minutes.

FPC's revised commitment is:

FPC will assure there are five (5) air packs (SCBA) in the control room for the necessary control shift. The air packs are included in the preventative maintenance program for air packs, and the CR-3 operating shift personnel will receive refresher instruction on donning and using the air packs.

This commitment will still provide for the protection of the CR-3 operators against the effects of  $SO_2$ . Since there are detectors at the tank which alarm in the CR-3 control room, the operators will now have time to assess whether a toxic gas event has actually occurred or not before donning the SCBAs which can restrict an operator's vision and impede communication. Also CR-3's operating procedures require that the control complex ventilation system be placed in the recirculation mode before any  $SO_2$  transfer takes place at CR-1. We believe these actions will assure that CR-3 can continue to operate without placing additional burdens on our operators by requiring the masks immediately. FPC is not restricting the use of the masks. If operators want to use SCBAs at any time, they may do so.

Sincerely,



P. M. Beard, Jr.  
Senior Vice President  
Nuclear Operations

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xc: Regional Administrator, Region II  
Senior Resident Inspector  
NRR Project Manager