[DNFSB LETTERHEAD]

November 1, 1990

Mr. Victor Stello, Jr.
Deputy Assistant Secretary for Facilities
Office of Defense Programs
Department of Energy
Washington, DC 20585

Dear Mr. Stello:

Enclosed for your consideration and action, where appropriate, are a number of observations concerning the fire protection and station blackout features of the Savannah River Reactors. These observations were developed by Ajit K. Gwal of the Defense Nuclear Facilities Safety Board (DNFSB) staff based on a review of available documents and discussions with Department of Energy (DOE) staff and contractor personnel.

We request that a meeting be arranged on these two topics at which DOE and its contractors would discuss with us their safety evaluations of these features, with particular emphasis on the enclosed DNFSB staff observations.

If you need further information, please let me know.

Sincerely,

John T. Conway
Chairman

2 Enclosures:

Memorandum dated October 1, 1990, to E.G. Case from A.K. Gwal
Memorandum dated October 30, 1990, to E.G. Case from A.K. Gwal with attachments which are UCNI

[DNFSB LETTERHEAD]

October 1, 1990

MEMORANDUM FOR	Edson G. Case, Member
FROM:	A.K. Gwal
SUBJECT:	SRS-Fire Protection Programs

This is to apprise you of the adequacy of SRS-Fire Protection Programs with respect to Appendix R and its SAR commitments. At this point I have not performed a detailed design study and the following discussion is based only on the review of References 1 through 7 given below.

References

1. Restart Strategy Savannah River Plant K-Reactor, November 25, 1988.

2. Westinghouse Independent Safety Review (WISR) of SRS production reactors, April 1, 1989.

3. Savannah River Site Production Reactor Safety Analysis Report (SRS-SAR), K-Production Reactor, July 17, 1989.

4. Comparison of the Rocky Flats Plant to 10 CFR 50.48 and 10 CFR 50 Appendix 'R', May 30, 1990.

5. Reactor Operations Management Plan (ROMP), July 13, 1990.

6. DRAFT - Safety Evaluation Report (SER) restart of R-Reactor SRS, August 15, 1990.

7. Code of Federal Regulations -

   10 CFR 50.48 - Fire Protection
   10 CFR 50 Appendix 'R'

Discussion

Fires, when they occur, jeopardize the ability to safely shutdown a reactor, thus may affect public health and safety. NRC Fire Protection Regulations 10 CFR 50.48 mandates that all the commercial nuclear power plant, licensed to operate prior to January 1979 comply, specifically, to the applicable requirements of Sections III G, III J and III O of Appendix 'R' (Ref. 7). Under the Appendix 'R' definition of fire damage, suppression and detection systems alone will not prevent fire damage. Appendix 'R', specifically in Section III G, III J and III O additionally -requires (Ref. 7):

- Additional protection in the form of fire barriers and electrical isolation to maintain one redundant train of shutdown equipment free of fire damage.

- The provision of emergency lighting units with at least 8-hour battery power supply for all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

- The reactor coolant pump be equipped with an oil collection system.

SRS-SAR in its Design Bases Section for Fire Protection System 9.5.1.1 (Ref. 3) states that plant be designed so that a fire will not prevent essential Plant safety functions from being performed during the worst possible fire. Draft SER for SRS-SAR (Ref. 6) has not provided the safety evaluation of Fire Protection System.

A review of ROMP (Ref. 5), indicated that only some hardware improvements to fire protection capability are planned to be implemented e.g.

- Installation of fire detection equipment in critical building areas which are inaccessible during reactor operation.
- Installation of fire protection facilities to preclude spurious operation critical safety equipment.
- Installation of a fire hydrant inside protected area fence.
- Installation of a dry riser pipe running from the fire hydrant to the reactor building.

Westinghouse Independent Safety Review (Ref. 2) team of SRS has recommended the following in its WISR-22 as a long term fire protection program. ROMP has not included these items, since it is not required prior to startup.

- Prepare fire protection surveillance and operational requirements.
- Perform a formalized fire protection overview program (including area hazards analyses and fire design-bases studies).
- Install a standpipe and a new water source prior to startup.
- Review of use of the stairwells for required emergency access.

The U.S.-DOE Rocky Flats Plant was directed by oversight committees to compare the plant's fire protection program to the NRC Fire Protection Regulation in 10 CFR 50.48 Appendix R (Ref. 4). An evaluation was performed and a variety of recommendations were made and are listed in Reference 4.

Although SRS-SAR (Ref. 3, Section 9.5.1.1:design bases) states that plant will be designed so that a fire will not prevent essential plant safety functions from being performed during the worst possible fire, it is not evident from above that design considered the criteria e.g.

- The separation of cables and equipment of redundant trains by a fire barrier having a 3-hour rating (Appendix R).

  or,
- Separation of cables and equipment of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible (Appendix R).
- etc.

Above such criteria are used to prevent the loss of redundant trains (cables and equipment) by one fire, thus enhancing the safe shutdown and reduced possibility of radioactive release. Not having started with criteria like Appendix 'R' it is not possible to make statements about safe shutdown of plant (Ref. 3, Section 9.5.1.1) unless the fire protection design is reviewed and compared to Appendix R.