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MEMORANDUM

TO: D. E. Bessette, ACRS Staff

FROM: Dr. Richard G. Pearson, ACRS Consultant *R. G. Pearson*

SUBJECT: Waterford 3 Review, June '8-19, 1981--Comments

1. In general within my area of expertise, human factors engineering, I was impressed with the qualifications and presentations made by the Los Alamos Technical Associates group, especially insofar as they have the Lockheed group behind them on control room design.
2. A principal concern I shared with Ivan Catton involves the composition of the three "Review and Audit" groups:
  - a. SRC--Safety Review Committee;
  - b. PORC--Plant Operating Review Committee;
  - c. OSRS--Onsite Safety Review Subgroup.

At present the composition of these groups is restricted to technical personnel (engineers; physicists) and executive/management level personnel. I would like to see a broader mix of people including some who can address issues in the areas of human performance, selection, training, medical and human factors, and performance appraisal. Ultimately operational safety will be dependent upon effective human performance involving not only operators but also maintenance personnel. There should be some "expertise" involved in auditing such performance determinants as vision of operators, noise, illumination, work-rest schedules, stress, boredom, seating, job performance aids, display factors, and control design.

Consequently I would recommend:

- a. Personnel with human factors, medical, and/or industrial/organizational psychology expertise on the SRC. Possibly LP&L could include the head of the Personnel Department (I assume they have such a department). Also, perhaps a physician. Do they have a corporate medical staff?
- b. That the training manager (superintendent) serve on the PORC.
- c. Someone in the human factors or industrial/organizational psychology area on the OSRS. This person should have concerns (and relevant expertise) relative to the control room environment, operator performance, and maintenance personnel effectiveness.

If such personnel are not or will not be available with LP&L, then the company should consider the employment of consultants from reputable firms or universities.

3. In the areas of training I have some concerns. Some operators will have had experience at other plants; others will have been trained as fresh recruits on simulators offsite. The major problem here is what is termed "habit interference". That is, habits (skills) acquired in one setting with particular control-display relationships, whether operational or simulated, may conflict with performance in the new setting. In short, old habits must be "unlearned" and new ones must be well practiced, otherwise the operator is likely to resort to his old habits in emergency situations (i.e. under stress) and make errors. This is a well known phenomenon in human performance, and is a causative factor in many accidents. Ultimate installation of an onsite simulator with good fidelity in terms of the actual Waterford 3 control room operation will be an important milestone. Until then, the habit interference problem must be addressed both in terms of training and operational practice as well as by the philosophy of the training superintendent. With regard to the latter point the figure presented by Joe Edwards (presentation A/1 3.6) relating to simulator retraining and operator effectiveness is hypothetical. While the theory here is relevant to the effects of practice on the simulator, it is only valid under conditions of high simulation fidelity.
4. In conclusion you may wish to consider as Agenda Items for the proposed August 4th meeting the following:
  - a. Composition of the "Review and Audit" groups;
  - b. Qualifications of proposed training superintendent, and clarification of training policy and procedures to deal with the "habit interference" issue.