

Supplemental Comments to Sargent & Lundy
Comment Dated 9/29/80 On NUREG-0696,
"Functional Criteria for Emergency Response Facilities"
July 1980-Draft Report for Interim Use and Comment

General Comments

1. Data Base

The Emergency Response Facility (ERF) data base is specified as (at a minimum) all variables included in R.G. 1.97 including Types A, B, C, D, and E. This presents problems because:

- (a) R.G. 1.97 Rev. 2 has been "withdrawn" and no information is available on when R.G. 1.97 will be revised and reissued. Therefore, commitment to use 1.97 as a "minimum data base" carries with it presently undefined consequences.
- (b) Rev. 2 of R.G. 1.97 described Type A instruments as those required for "pre-planned manual actions". It is of significance that R.G. 1.97 Rev. 2 did not list these instruments because the list would be very extensive and could contain most of the information presently available in the main control room.
- (c) Rev. 2 of R.G. 1.97 listed portable instruments among the Type E instruments. It is not clear as to how this information will be included in the "data base".
- (d) Rev. 2 of R.G. 1.97 listed valve position indication for many valves as type B, C, & D information. Typically these are lights that are displayed on the control board and are wired directly into the valve motor control circuits. It would be:
 - (d.1) Undesireable to bring high level motor control circuit voltages to the ERF data acquisition system processor.
 - (d.2) Not cost effective to require the addition of relaying devices for each indication device to generate a signal to the ERF data processor.
 - (d.3) Undesireable to overload the ERF data processor with the number of signals required to show valve position for all of the valves included in the R.G. 1.97 Rev. 2 data base.

For all of the above reasons, the use of R.G. 1.97 as a minimum data base should be reevaluated. The problem is far more severe on conventional direct wired plants than it might be on a computer based control room plant. Therefore it is recommended that the "minimum data base" be established with consideration of the existing plant design, and with provisions for review after R.G. 1.97 is formalized and reissued.

2. Unavailability

The NUREG requires that the emergency response facilities be designed to achieve quantitative functional unavailability goals as follows:

<u>Emergency Response Facility Feature</u>	<u>Maximum Unavailability Design Goal/Requirement</u>
SPDS (as a system)	.001/Yr
TSC (data display system)	.01/Yr
TSC (individual parameters monitoring)	.001/Yr
EOF (as a data system, upon activation of instrumentation and power supplies)	.001/Yr (Note 1)*

*Note 1: Page 19 of the NUREG states the overall EOF unavailability should be 0.001. This number is inconsistent with the TSC overall unavailability. At the NRC Region III Workshop meeting in Chicago, NRC representatives stated the correct number for EOF unavailability should be .01.

Questions at the Workshop regarding the detailed nature of how industry could achieve and demonstrate such design goals went unanswered by the NRC. It was noted at the workshop that a recent report by EPRI on the subject of system reliability goals, states that levels of availability greater than 99.8% (an unavailability of .02 or less) cannot be achieved using present day technology except at unreasonable cost.

There is also a divergency of the requirements for specific unavailabilities described in the NUREG. For example, on page 8 for the SPDS, the statement is made that "The total system shall be designed to achieve an unavailability goal of .001 for the SPDS." On page 19 under the EOF discussion, the "goal" becomes phrased as a specific requirement: "Once the EOF is activated, instrumentation.....shall have less than .001 unavailability".

The divergence in these two treatments is significant. An unavailability goal recognizes the difficulty in meeting that goal and admits a possibility that the goal can not be achieved. Presumably the design and manufacture can proceed and the resultant unavailability can be determined over an operating period. On the other hand, a requirement for a specific unavailability admits no possibility that the specified number can not be achieved. Further, it introduces the possibility that the "unavailability" factor be demonstrated prior to acceptance of the equipment. This latter possibility could defeat all attempts to have an effective Emergency Response Facility data system in place and operating in the next five to six years notwithstanding the scheduled implementation dates of January 1, 1982 for operating reactors.

Accordingly it is recommended that:

- (a) The NUREG language be modified to clearly establish that the unavailability numbers used are considered design goals which will be monitored over a specified operating period. If the goals are not being met, equipment modifications would then be required. If there is a gross departure from the design goals, additional actions could be imposed by the NRC.
- (b) The initial design goals be relaxed to the point where there is at least a reasonable probability that they can be achieved. Unavailability of .005 for individual data channels would seem to be a lower bound.
- (c) Provide a specific definition of what constitutes unavailability. For example, it should not include periodic tests and calibration, routine preventative maintenance, etc.

3. Use of Existing Data Processing Equipment

In the description of the data systems for the emergency response facilities, specific prohibitions are placed on the use of the existing unit process computer. This prohibition, applied as it is to all facilities regardless of their design is arbitrary and irresponsible. In many instances there is no technical reason why the same data processing equipment could not be used to provide information both to the Main Control Room and to the TSC, EOF, and ND. Further, provided that the computer is properly designed for administrative security and with redundancy in power supplies, central processing units, and with flexibility for backup data files and executive routines, it would be desirable to have a common data base between the Main Control Room, TSC, EOF, and ND.

Therefore, it is recommended that all prohibitions against the use of existing station process computers be removed from the NUREG and replaced with a set of functional requirements for the control complex data processing system with a significant but realistic "unavailability goal".

Specific Comments

4. Safety Parameter Display System

The description of the Safety Parameter Display System can be clarified further. For example:

- (a) On page 7, Section E, the operating modes for which an SPDS display is required should be defined.
- (b) Item II B Page 6, the words "additional SPDS displays" in the first sentence can be variously interpreted. For example, while the NUREG states that the SPDS display in the Main Control Room must be continuous (i.e., a dedicated display), it is possible to interpret that the TSC & EOF SPDS display need not be dedicated and continuous displays.
- (c) Item II D, Page 7, this paragraph, by stating that only control room operating staff are required for SPDS operation, implies that the control room operator selects the primary as well as the secondary and possibly historical data displays for the SPDS in the TSC and the EOF. It is recommended that this item be clarified by allowing independent data callup from each SPDS display location.
- (d) The requirement to qualify the SPDS data processor to OBE requirements in the time frame allotted is not reasonable. The requirement should be modified to require a well designed substantial computer system that meets specified unavailability requirements.
- (e) Item II F, Page 8, confusion has been built into this document by multiple uses of the phrase "data acquisition system": Sentences 2 and 3 of Item II F. use the phrase as a synonym for sensors, signal conditioners, power supplies, etc. which require 1E qualification as SPDS inputs. However, Figure 1 and other locations in the text refer to "data acquisition system processor" which need not meet 1E qualification.

Recommendation: In Item II F, sentences 2 and 3 change "data acquisition system" to "individual data channels". In #4, change "processing and display devices of the SPDS" to "SPDS data acquisition system processor."

5. Verification and Validation Criteria

Item I.D Page 5 Clarification of "original designers and developers" is required because the phrase can be applied to organizational or individual designers or developers.

Recommendation: Independent reviewers within the same organization should be permitted.

6. Technical Support Center

- (a) Item III.H, Page 13 - The "power supplies" for the TSC should be functionally described. For example, instrument power, data acquisition system processor power, HVAC power, lighting power, communications power, etc.
- (b) Item III.A, Page 9 - It does not appear to be practical or desirable to allow interactive capability between NRC Headquarters and the Emergency Response Facility data base. This concept if allowed to remain would promote the idea that accident management could not be accomplished locally.

Recommendation: Delete the sentence that starts, "It may be desirable to provide.....emergency management" in the 4th paragraph on page 9.

- (c) Item III.I, Page 14 - Change "format compatible with NRC machines" to "format to be defined later by NRC". The same comment also applies to Item IV.I, Page 20. This change identifies the agency responsible for the actual definition of format.

7. Nuclear Data Link

- (a) Item V. B. g, Page 22 - Only a very small portion of the R.G. 1.97 data channels are subject to data transients of such rapidity and magnitude that it would be desirable to "capture" this information within the one second scan rates. It is therefore not economically justifiable to develop a peak value monitor, integrator, and transmitter system that would have to be integrated into the normal one second data transmittals to the NRC. It is recommended that these peak values be retained on recorders or magnetic tapes for manual retrieval and data reduction.
- (b) Item V, B, c.3 - The requirement for uninterruptable power supply for the ND L can not be justified in view of the fact that the power supplies for the remainder of the Emergency Response Facility must match the unavailability goals for the basic data channels, and will require a backup emergency source other than the existing 1E distribution system. The time in which the ND L may be without power need not be any less than the time permitted for the SPDS or the entire TSC data base.