

THE BABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

J. M. [unclear]

To	G. M. Olds, Manager, Nuclear Service	File No. or Ref.
From	B. A. Karrasch, Manager, Plant Integration	
Cust.	177 - A-1	Date March 29, 1978
Subj.	SMUD Cooledown Incident	

BDS 443-5

This letter is for the customer and is not to be used.

On March 20, 1978, SMUD experienced a loss of power to a substantial portion of the non-nuclear instrumentation (see details - Attachment 3). Although the Reactor Protection System (RPS) and Safety Features Actuation System (SFAS) functioned properly, SMUD still experienced the most severe thermal transient on any B&W plant to date. The subsequent investigation pointed out that additional guidance to our operating customers in the area of limiting potential events of this nature is warranted. Accordingly, the Engineering Department recommends that our operating plant customers be informed of this incident, and suggestions be made on how to minimize the plant thermal transient for loss of NNI and other similar events. Attachment 1, a sequence of events, and Attachment 2, a series of descriptive curves, are provided to assist you in preparation of a customer letter.

In addition, the following recommendations should be made to assure proper operator action for events of this nature:

1. Operators should be trained to recognize a loss of power to all or a majority of their NNI (indicators fail to mid-range, automatic or manual transfer to alternate instrument strings brings no response, etc.). The loss of power is emphasized here rather than the failure of any one instrument or control signal. These minor events are adequately covered in our present simulator course.
2. Given that the operator can determine that he has lost power to all or most of the NNI, he should know the location of the power supplies and power supply breakers and have a procedure available to regain power.
3. If the fault cannot be cleared (e.g., the breakers to the power supplies reopen), he should have a list of alternate instrumentation available to him. Some possibilities are:

- a) ESFAS panels
- b) RPS panels
- c) ECI
- d) SRGI

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- e) Remote shutdown panels
- f) Local gages
- g) Plant Computer

Note that each plant will be different in detail, but the list should be developed in advance and the operators thoroughly trained in its usage.

4. The above instrumentation sources should also be keyed to certain critical variables to help the operator select his priorities during the emergency condition. It is recognized that no procedure can cover all the possible combinations of non-nuclear instrumentation failures, however, if the operator knows he has an instrument problem (as opposed to a LOCA or steam line break, for example), he can limit the transient by controlling only a few variables. These are:

- a) Pressurizer level (via EPI or normal makeup pumps)
- b) RCS pressure (via pressurizer heaters, spray, E/M relief valve)
- c) Steam generator level (via feed flow, feedwater valves)
- d) Steam generator pressure (via turbine bypass system)

The pressurizer level and RCS pressure assure that the Reactor Coolant System is filled and the steam generator level and pressure assure adequate decay heat removal.

In our opinion, the preferred solution is to install safety grade steam generator level instrumentation, start auxiliary feedwater on a low level steam generator signal, and control steam generator level automatically, as is required on our IGTSC plants. This may not be a practical backfit solution for the operating plants, however, this solution should be suggested as a possible way to assure minimal lost capacity days due to equipment failure. Plant Integration will be happy to assist you in the preparation of the customer letter.

B. Karrasch

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