

- INTERIM REPORT -

SAFETY INJECTION SYSTEM PIPING DEFICIENCY  
November 21, 1979

I. SUMMARY

During a routine design review, a design deficiency was discovered in a Safety Injection System (SIS)/Containment Spray System (CSS) containment emergency sump piping design. The weld between the sump liner and the process pipe was not sufficient to carry the design loads. If left uncorrected, a failure of the weld joint would create stresses in the associated recirculation valve that would exceed the design criteria. Failure of this valve to open would prevent the SIS/CSS from performing its intended function of mitigating the consequences of an accident. A design investigation is underway to determine the options available to correct this design deficiency. An investigation is also underway to determine if this occurrence is indicative of a deficiency in the design control system or was the result of an isolated incident.

II. DESCRIPTION OF THE INCIDENT

During a routine review, a design deficiency was discovered which, if left uncorrected, could have adversely affected the safety of operations. The joint between the 16 inch Safety Injection System piping and the emergency sump liner was shown on the construction drawing to be a one-quarter inch seal weld, which does not meet the design load criteria. The location of this weld is shown in Figure 1.

The piping is part of the SIS and CSS and leads from the containment emergency sump through the containment sump isolation valve to the safety injection and containment spray pumps. Following a LOCA, water will automatically be recirculated from the emergency sumps to the reactor by the Safety Injection System. Operation of the containment emergency sump isolation valve is required for recirculation mode operations. The seal weld in question attaches the process pipe to the sump liner. Sketches of this configuration are given in Figures 1 and 2.

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### III. CORRECTIVE ACTION

When this deficiency was discovered, the Engineer who identified the problem reported it on an Engineering Design Deficiency Report, as required by Engineering procedures. An investigation into corrective actions and recurrence control was begun.

Resolution of this problem will consider the following:

- Recirculation valve end loads
- Containment liner load limits
- Safety injection pump nozzle loads
- Sump liner load limits
- Containment sleeve load limits
- Differential settlement criteria

Investigation of design alternatives has begun. A schedule for these activities is contained in Figure 3.

An investigation into the cause of this deficiency is also underway. This investigation will include an evaluation of the implementation, adequacy and effectiveness of project procedures relative to design control and design verification.

### IV. SAFETY ANALYSIS

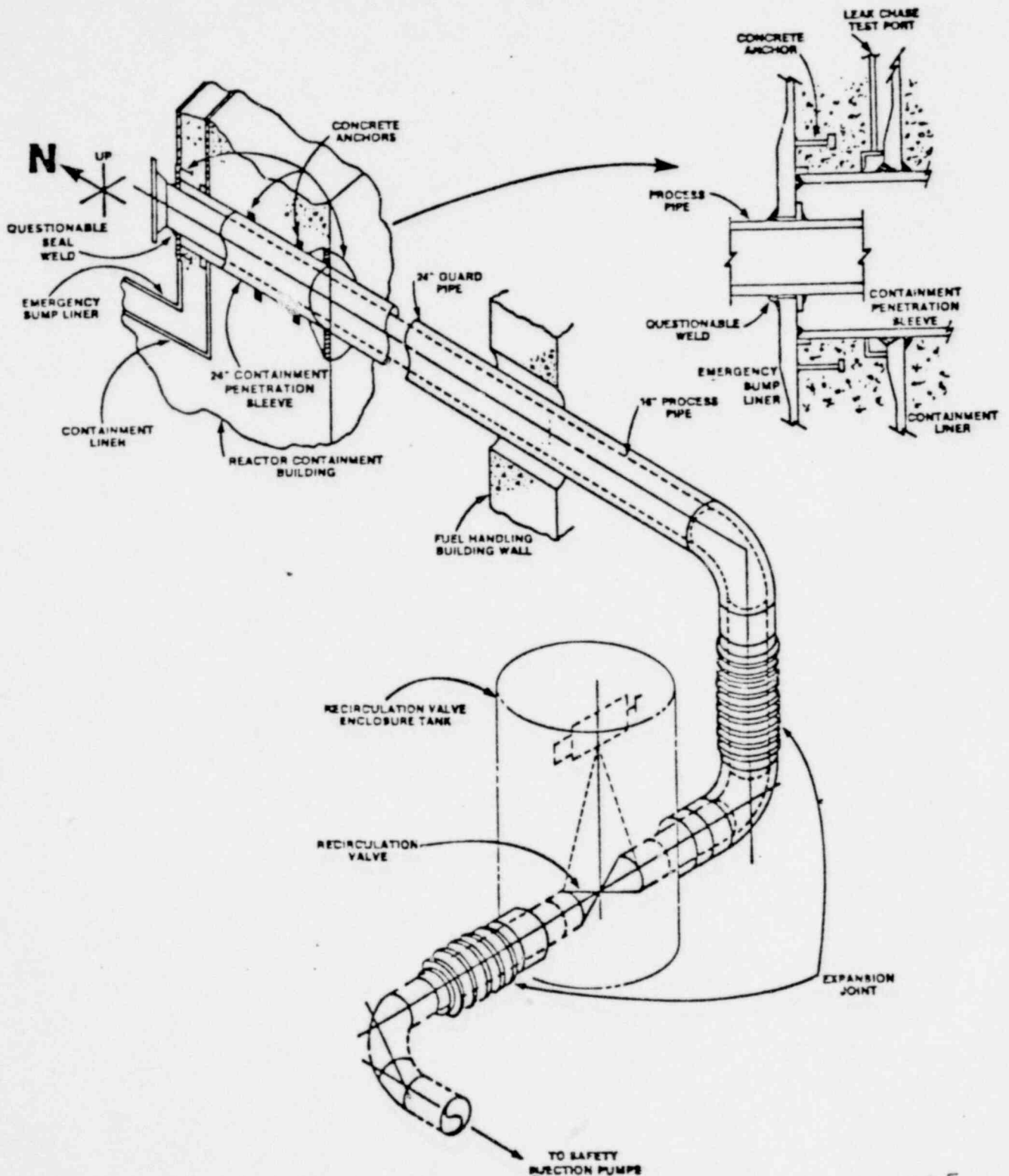
If this deficiency were to have been left uncorrected, the weld at the sump liner/process pipe interface could fail. The process pipe would then be free of restraint and would impose a load on the recirculation valve which exceeds the allowable end loads. It could not then be guaranteed that the valve would operate as required. Because this problem affects all three trains, this is a common mode failure which could cause loss of safety system functions.

### V. CONCLUSION

Determination of the most appropriate correction for this deficiency is dependent upon completion of the investigation of the cause(s) of the deficiency and evaluation of corrective action alternatives. A complete description of the cause(s), corrective action, and recurrence control will be provided in a final report on March 23, 1980.

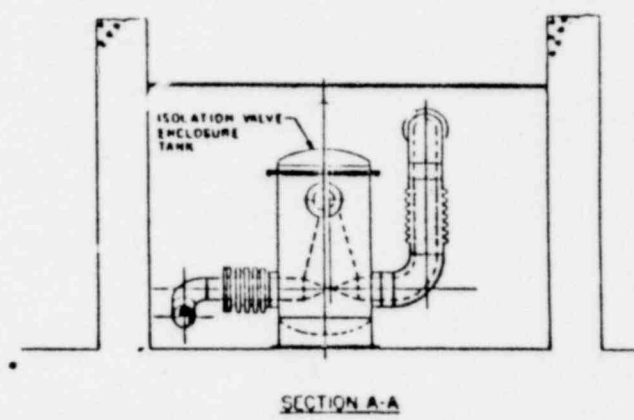
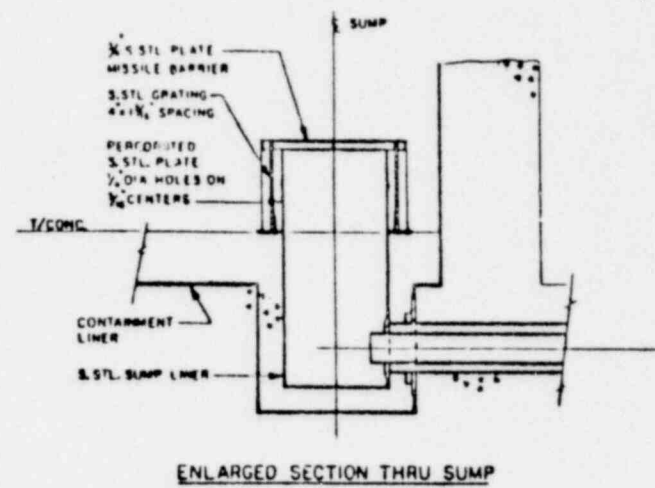
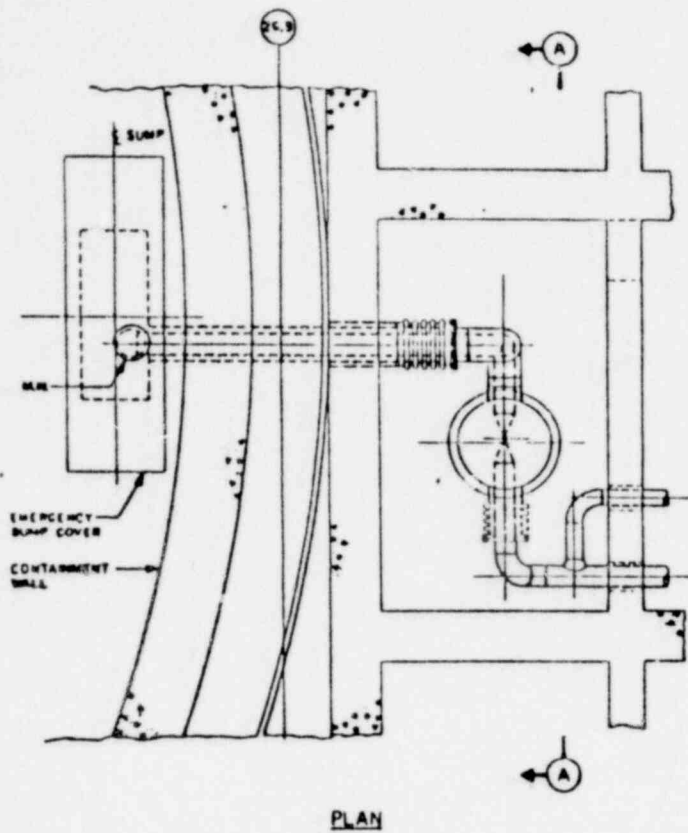
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# SAFETY INJECTION SYSTEM RECIRCULATION LINE



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FIGURE 1 PIPING LAYOUT



SOUTH TEXAS PROJECT  
UNITS 1 & 2

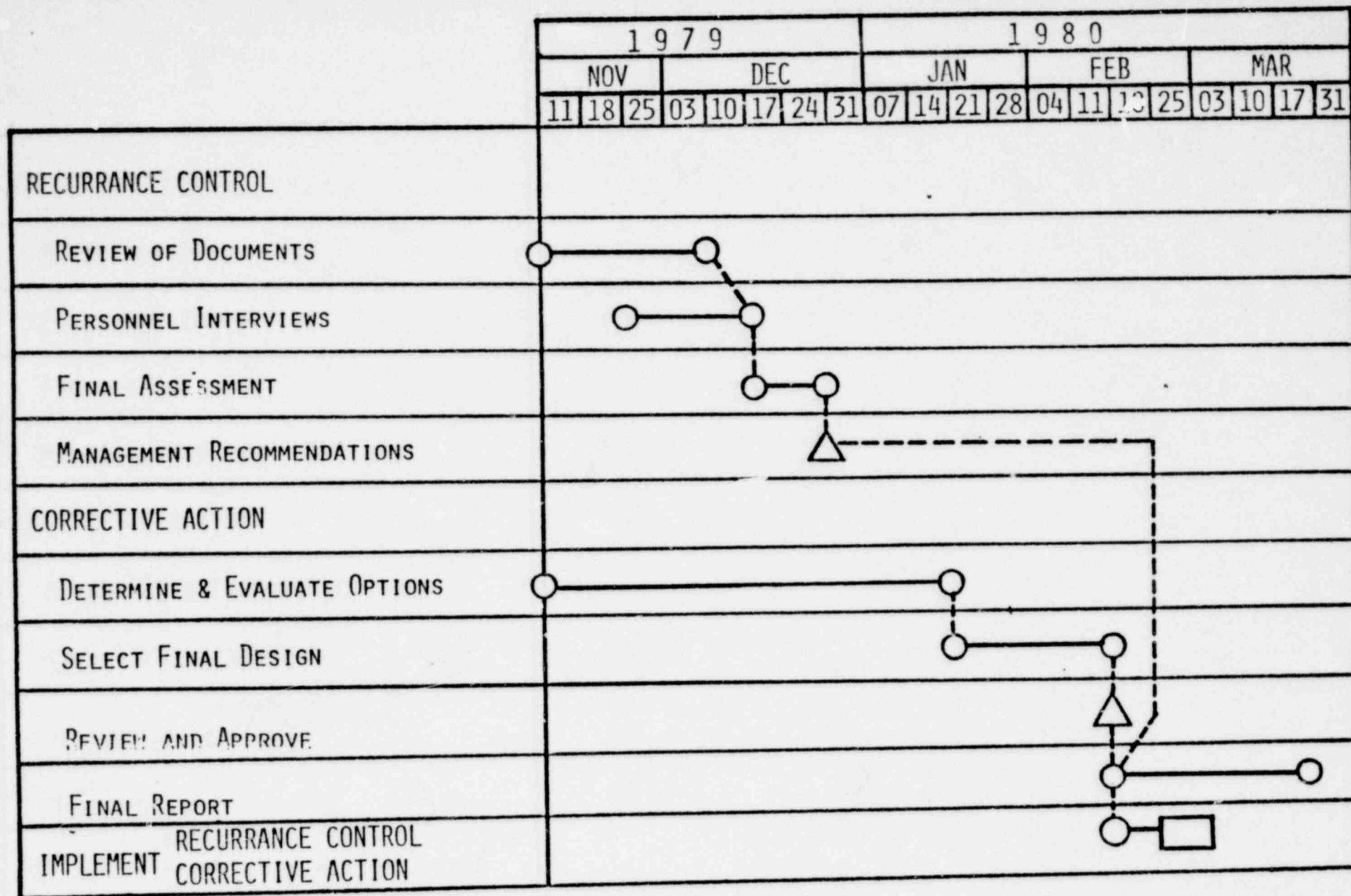
ARRANGEMENT OF SUMP PIPING  
AND VALVE ISOLATION TANK

FIGURE 6.2.4-2

FIGURE 2 SYSTEM SCHEMATIC DIAGRAM

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○ MILESTONE  
△ DECISION

FIGURE 3. SCHEDULE FOR THE COMPLETION OF ACTIVITIES