**HIGH LEVEL WASTE (HLS) STEAM REDUCING STATION
EVALUATION (U)**

by
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HIGH LEVEL WASTE ENGINEERING

FACILITY ENGINEERING SECTION

WSRC-TR-93-509

REVISION: 0

KEYWORDS:

Relief Valve

Valve

Steam

Pipe

RETENTION:

PERMANENT

CLASSIFICATION:

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Authorized Derivative Classifier

HLW STEAM REDUCING STATION EVALUATION (U)

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INTRODUCTION

Existing pressure equipment in High Level Waste does not have a documented technical baseline. Based on preliminary reviews, the existing equipment seems to be based on system required capacity instead of system capability. A planned approach to establish a technical baseline began September 1992 and used the Works Management System preventive maintenance schedule (Reference 1). Several issues with relief valves being undersized on steam reducing stations created a need to determine the risk of maintaining the steam in service. An Action Plan was developed to evaluate relief valves that did not have technical baselines and provided a path forward for continued operation (Reference 2).

SUMMARY

Evaluations have shown that several steam reducing stations need design modifications to have adequate over pressure protection. Based on Action Plan WER-HLE-931042 (Reference 2), the steam systems will remain in service while the designs are being developed and implemented. Steam stations requiring modifications are listed by IDP number and indirect work request in Attachment 1.

DISCUSSION

After reviewing the steam pressure reducing stations for High Level Waste, several are not adequately designed to prevent the system from being over pressurized. Indirect work packages for the steam pressure reducing stations have been generated to provide over pressure protection.

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Present safety relief valves typically are designed to the system required capacity instead of the system maximum capable capacity. Original designs did not take the bypass valve or the piping pressure drop into account when designing the pressure reducing stations. Flow capacities of the bypass valve and pressure reducing valve, have typically been twice the capacity of the safety relief valve.

During September 1992 an evaluation plan (Reference 1) was developed to create or update the technical baseline for all pressure equipment in Waste Management as a result of ETF Occurrence Report SR-WSRC-ETF-1992-0003. Actions required by this plan included: walkdown of equipment; updating WMS records; complete design records when required. Scheduled preventive maintenance work orders were reviewed as they were issued each month and updated as required. This plan is proceeding as scheduled.

After a safety relief valve supplying steam to the 2F evaporator failed a scheduled preventive maintenance test, the evaluation of the equipment showed that the reducing station was not adequately protected from over pressurization. Evaluating other H and F evaporator steam reducing stations also revealed that they were not properly protected from over pressure. Realizing numerous modifications would be required, an Action Plan was developed to provide an organized path forward (Reference 2).

The Action plan focused specifically on steam reducing stations for several reasons. Steam was considered the largest source of stored

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energy compared to water and compressed air. All of the air compressors had current verification records showing compressed air equipment was adequately protected from over pressure. Water systems were considered a lower risk because they usually have a smaller amount of stored energy and water failures are commonly small leaks.

Several requirements were generated from the Action Plan. All steam pressure reducing stations in High Level Waste were walked down by a representative from High Level Waste Engineering and Operations. Reducing stations that did not have a documented, approved basis had the bypass valve locked or administratively closed until the evaluations and modifications could be incorporated. Per the Action Plan, steam systems will stay in service while the evaluations and modifications are completed.

All steam pressure reducing station evaluations are complete and indirect work requests have been issued for design. Thirty-three reducing stations were listed in WMS (Reference 3). Eight had been verified and modified in the past, five will be deleted or taken out of service and three required no changes. The remaining seventeen stations required at least one change if not a combination of changes. Types of changes include: 15 relief valve and associated piping modifications; 9 smaller bypass valves; 4 regulator capacity reductions. Any new reducing stations are required to have an evaluation performed before being placed in service.

ACTIONS

Indirect work requests have been issued for the remaining twelve steam reducing stations that require modifications. Before the NCRs are closed, all modifications must be completed in the field.

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Attachment 1 lists the IDP number, work request, and NCR number associated with each station. All equipment modifications are required to be incorporated into the WMS equipment record under the safety relief valve IDP number. A priority has been assigned to the steam stations that require modifications based on the degree of over pressure protection deficiency. Indirect work request should be processed and modifications completed based on the priority schedule.

REFERENCES

1. Saunders, S.A., WER-WME-921063, Pressure Equipment Evaluation Plan (U), September 4, 1992.
2. Bates, W.F., WER-HLE-931042, High Level Waste Pressure Relief Device Evaluation Plan, May 21, 1993.
3. Gannon, R.G., WER-HLE-931067, Steam Reducing Station Bypass Valves, May 27, 1993.

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ATTACHMENT 1

STEAM REDUCING STATION INFORMATION

<u>IDP NUMBER#</u>	<u>WORK REQUEST #</u>	<u>NCR #</u>
21898801	KQM14	93-NCR-22-0408
21898809	KQM17	93-NCR-22-0424
21898811	KQM16	93-NCR-22-0424
21899512	KQM08	93-NCR-22-0424
21899516	KQM15	93-NCR-22-0424
26899740	LAR73	93-NCR-22-0436
26895000	LAR73	93-NCR-22-0436
26895500	LAR73	93-NCR-22-0436
26899790	LAN81	93-NCR-22-0436
26897000	MHR29	93-NCR-22-0433
26897002	MHR30	93-NCR-22-0433
26897988	R3397	93-NCR-22-0433

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Revision 0

Relief Valve

Valve

Steam

Pipe

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