PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 137918

Date: April 23, 1978

Title: Reactor Cooldown Exceeds Limit at Three Mile Island 2, Safety Injection at Three Mile Island 2

The failure sequence was:

1. A reactor trip occurred due to an instrumentation noise spike.
2. Following the turbine trip, four main steam relief valves on one SG and one on the other SG failed to reseat properly, eventually reseating about four minutes into the event.
3. The feedwater system was slow in isolating (2 1/2 minutes).
4. Safety injection occurred due to the depressurization of the RCS.
5. Pressurizer level was lost for approximately one minute.

Corrective action;

1. Prior to return to criticality, the relief valves were to be tested.
2. The source of the instrumentation noise spike was being investigated.
3. ICS tuning was to continue throughout initial plant startup to achieve proper transient response.

Design purpose of failed system or component:

1. The relief valves provide over-pressure protection for the steam generators.
2. Feedwater isolation is provided to terminate flow to the steam generators in the event of a steam line break and other overcooling transients.

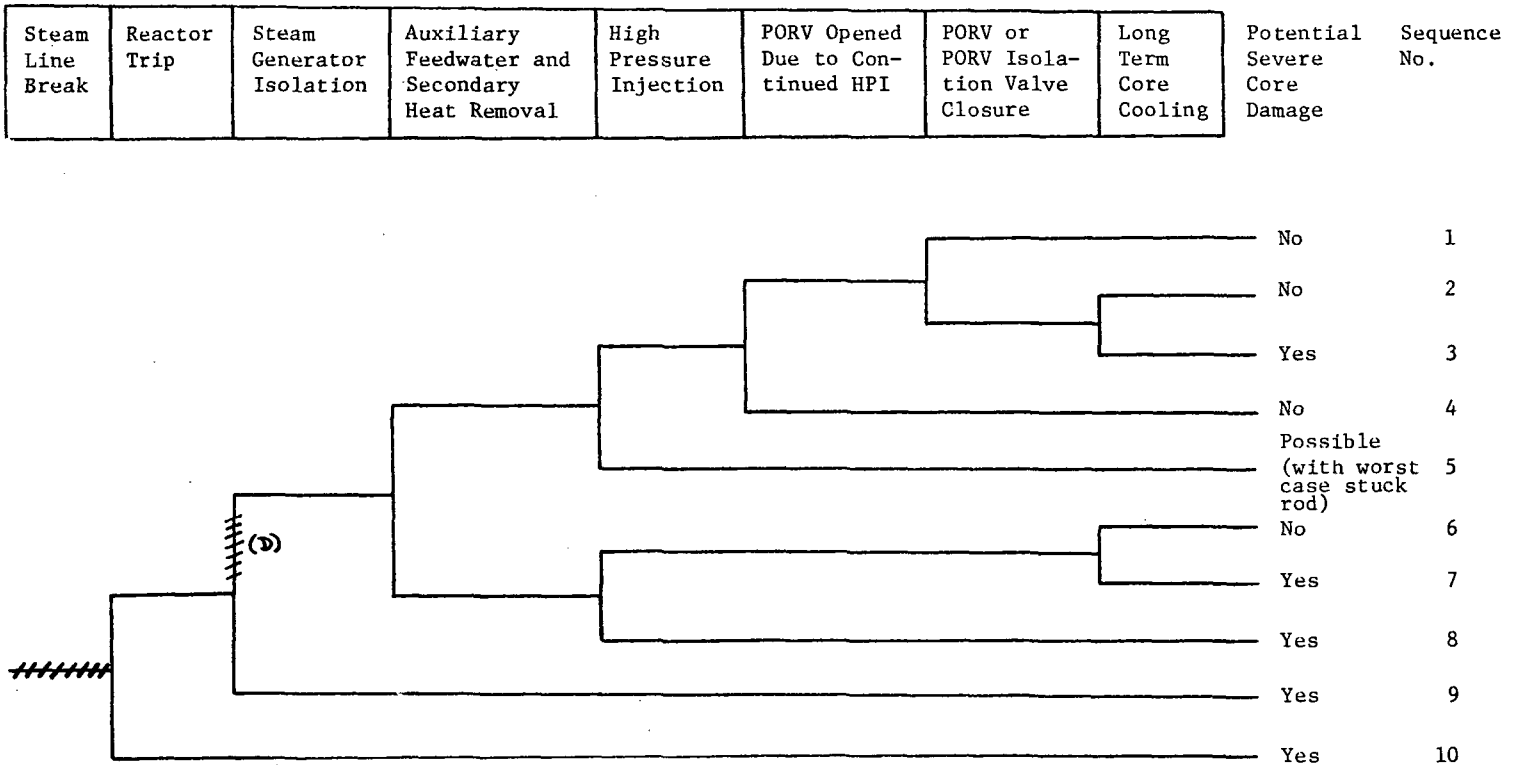
Unavailability of system per WASH 1400:* N/A

Unavailability of component per WASH 1400:* relief valve, failure to reseat, $\sim 10^{-2}/D$.

*Unavailabilities are in units of per demand D^{-1}. Failure rates are in units of per hour HR^{-1}.

Reactor at 30% power, RPS channel C tripped due to NI-7 inoperable, noise spike on second NI-channel (NI-8)	Turbine trip secondary system pressure transient, seven main steam relief valves lift	Five relief valves fail to reseat at proper pressure	Slow feedwater isolation valve closure plus operator failure to realize feed-water pumps in manual results in S/G overfeed	Rapid RCS depressurization, shrinkage, and cooldown rate exceeding limits	High pressure injection restores pressurizer level	Relief valve closure after 4 minutes	Potential Severe Core Damage
							No
							No
							No
							?
							No
							No
							No
							?
							No
							No

NSIC 137918 — Actual Occurrence for Reactor Cooldown Exceeds Limit and Safety Injection at Three Mile Island 2



NSIC 137918 — Sequence of Interest for Reactor Cooldown Exceeds Limit and Safety Injection at Three Mile Island 2

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 137918

DATE OF LER: May 8, 1978

DATE OF EVENT: April 23, 1978

SYSTEM INVOLVED: Main steam, main feedwater

COMPONENT INVOLVED: Main steam relief valves

CAUSE: Relief valve failure to properly reseat, failure to properly secure feedwater.

SEQUENCE OF INTEREST: Steam line break

ACTUAL OCCURRENCE: Multiple stuck-open relief valves (long period blowdown)

REACTOR NAME: Three Mile Island 2

DOCKET NUMBER: 50-320

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 906 MWe

REACTOR AGE: .1 yr.

VENDOR: Babcock & Wilcox

ARCHITECT-ENGINEERS: Burns & Roe

OPERATORS: Metropolitan Edison

LOCATION: 10 miles SE of Harrisburg, PA

DURATION: N/A

PLANT OPERATING CONDITION: at 30% power

SAFETY FEATURE TYPE OF FAILURE: (a) inadequate performance; (b) failed to start; (c) made inoperable; (d) _____

DISCOVERY METHOD: transient following reactor trip

COMMENT: —