

## PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 172198

Date: January 18, 1982

Title: Inadvertent MSIV Closure and Inadvertent Safety Valve Lifts at St. Lucie 1

### The failure sequence was:

1. At 4:14 a.m. on December 19, 1981, a combination of low instrument air pressure to the MSIVs and a slightly higher than normal steam flow resulted in the inadvertent closure of both MSIVs.
2. The reactor pressure increased to 2410 psig (normal lift pressure is 2500 psig), causing a reactor trip on high pressurizer pressure and opening the PORVs. Pressurizer code safety valve V1200 apparently also opened, but this was not realized at the time.
3. The quench tank rupture disk ruptured because of the relief valve discharge.
4. Pressurizer safety valve V1200 disk and seat were probably damaged during the lift due to the improper installation of an adjusting ring set screw, but this was not known at the time.
5. The reactor was restarted and held below the power range during repair of the rupture disk and MSIV trouble shooting.
6. At 1:45 p.m. with the RCS at normal operating pressure, valve V1200 again spuriously opened and was verified open by acoustic flow monitor indication. A high blowdown (34% in lieu of the specified 4%) occurred due to a maladjusted nozzle ring.
7. RCS pressure decreased to 1670 psig and the reactor tripped on thermal margin/low pressure. A reactor cooldown was begun to replace V1200.
8. On December 23, 1981, after replacement of valve V1200, a turbine/reactor trip occurred during startup. The reactor was again started up and power operation was commencing when the "B" steam generator pressure relief valves started lifting. It was suspected that the "B" MSIV was closed even though it indicated open.
9. A shutdown and cooldown was initiated. The "B" MSIV was found to have one bent and one broken actuator connecting pin. The "A" MSIV was found to have two slightly bent connecting pins.

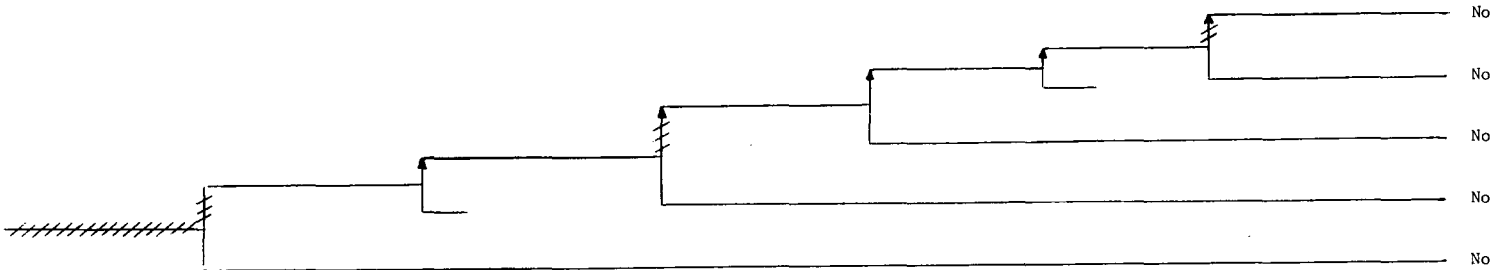
### Corrective action:

Pressurizer safety valve V1200 was replaced. The MSIVs were repaired.

### Design purpose of failed system or component:

1. The code safety valves provide relief protection to prevent vessel/piping overpressure during transient events.
2. The main steam isolation valves provide for steam generator isolation during steam line break events as well as providing for containment isolation.

<p>Reactor at power and MSIV (both valves) closure due to low instrument air pressure and slightly high steam flow</p>	<p>Reactor trip on high pressurizer pressure. Quench tank rupture Disk ruptured because of relief valve discharge. Pressurizer code safety VI200 apparently lifts (lift is undetected), disk/seat damage results from improper set screw installation</p>	<p>Reactor restarted and held below power range for rupture disk repairs and MSIV troubleshooting</p>	<p>Pressurizer code safety VI200 lifts spriously; high blowdown due to maladjusted nozzle ring</p>	<p>RCS pressure decrease, trip on thermal margin/Low pressure</p>	<p>Cooldown to replace VI200</p>	<p>Turbine/reactor trip during next startup; reactor restarted, power operation commencing when steam generator B saftey valve started lifting due to closed MSIV B (valve was indicating open)</p>	<p>Potential Severe Core Damage</p>
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NSIC 172198 - Actual Occurrence Tree for Inadvertent MSIV Closure and Inadvertent Safety Valve Lifts at St. Lucie 1



CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 172198

LER NO.: 81-056

DATE OF LER: January 18, 1982

DATE OF EVENT: December 19, 1981

SYSTEM INVOLVED: Main steam and pressurizer pressure relief

COMPONENT INVOLVED: MSIV, pressurizer code safety

CAUSE: MSIVs (spurious); PSRV (assembly error)

SEQUENCE OF INTEREST: LOFW

ACTUAL OCCURRENCE: LOFW

REACTOR NAME: St. Lucie 1

DOCKET NUMBER: 50-335

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 802 MWe

REACTOR AGE: 5.7 years

VENDOR: Combustion Engineering

ARCHITECT-ENGINEERS: Ebasco

OPERATORS: Florida Power and Light Company

LOCATION: 12 miles SE of Ft. Pierce, Florida

DURATION: N/A

PLANT OPERATING CONDITION: 98%

TYPE OF FAILURE: Inadequate performance

DISCOVERY METHOD:

COMMENT: