DLCS 3070102

MASTER

DUQUESNE LIGHT COMPANY

SHIPPINGPORT ATOMIC POWER STATION

TEST RESULTS

DLCS 3070102
T-641100-B

PRIMARY PLANT SELF-ACTUATED RELIEF VALVE OPERATION

CORE I SEED 2

Section 1 of 2 Sections

First Issue, March 13, 1961

DISCLAIMER

TEST RESULTS
DLCS 3070102
T-641100-B
PRIMARY PLANT SELF-ACTUATED RELIEF VALVE OPERATION
CORE I SEED 2

Purpose

To insure the reliable operation of the self-actuated pressurizer steam relief valve (06-H15-10).

Conclusion

The self-actuated pressurizer steam relief valve (06-H15-10) was tested to operate within the prescribed setting of 2300 + 50 psig. The valve popped at 2265 psig and reseated at 2190 psig, with a time lapse of 12.9 seconds between popping and reseating. Leak rates before and after popping of the valve were 0.70 gallons/hour and 1.35 gallons/hour, respectively. The valve performed reliably in that it popped within the prescribed setting and then reseated with no valve chatter or flutter being observed.

Description of Test Equipment and Test Procedure

The reactor plant was maintained at 500 F and 1800 psig with the reactor shutdown and three reactor coolant pumps (1A, 1B, 1C) on fast speed. The leakage of the pressurizer self-actuated steam relief valve (06-H15-10) was measured and recorded utilizing the leak collection vessel. Next, the pressurizer steam relief valve was tested by raising System pressure with the pressurizer to 2260 psig and lifting the valve open by use of the hand lifting level. The valve was held open for approximately five seconds and then released to close sharply. This operation was performed to blow out crud and other foreign matter to reduce the probability of any crud becoming lodged between the relief valve seating surfaces. System pressure was then raised with the pressurizer to actuate the valve and the performance was observed and data recorded. In order to actuate only this valve other relief valves were gagged to prevent them from popping. After the relief valve set pressure was determined, a leak rate of the valve was performed at System pressure and temperature of 1800 psig and 500 F, respectively.

Results

The pressurizer steam relief valve (06-H15-10) was tested on June 14, 15, and 18. This was the only valve that was tested for this performance of DLCS 3070102. On June 14 and 18, before and after the valve was popped, leak rate tests were performed. The leak rates were 0.70 gallons/hr and 1.35 gallons/hr., respectively. The leak rate increased by approximately a factor of two after the valve was popped. All water initially in the piping downstream of the relief valve was allowed to drain before commencing the leak rate measurements. It was also noted that the leak rate was constant over the one hour period. The leak rates are tabulated in Table I.

TEST RESULTS DLCS 3070102
T-641100-B
PRIMARY PLANT SELF-ACTUATED RELIEF VALVE OPERATION

The steam relief valve (06-H15-10) was popped at 1960 hours of June 15, 1960 at a pressure of 2265 psig and reseated at 2190 psig. This popping pressure was within the prescribed setting of 2300 ± 50 psig. Valve temperatures and plant parameters were taken before and after the valve was popped. The valve had a blow-down of 3.3% as compared to 4.0% blow-down on the previous performance of this test. The data recorded during the popping of the pressurizer steam relief valve is presented in Tables II and III. The valve performed reliably in that it lifted and reseated with no valve chattering or flutter being observed.

It was noted that steam was leaking out of the relief valve at the plug which covers the set screw. Steam was also observed leaking out of the other pressurizer self-actuated relief valve (06-H15-1) at the setscrew. The leak was noted when the pressurizer pressure was increased from 1900 psig to approximately 2300 psig. New copper gaskets were installed on the plugs of both valves (06-H15-1 and 06-H15-10) on June 23, 1960.

The Norwood Indicator for the pressurizer temperature was off scale at a pressure of 2260 psig. Using saturation pressure tables (Table 2) in Keynan and Keyes, Thermodynamic Properties of Steam, the pressurizer temperature was found to be 653 F.

TABLE I

Pressurizer Relief Valve (06-H15-10)

Date	Leak Rate	Leak Rate	
	Duration of Test	Inches of water	Leak rate (gal/hr)
6-14-60	45 Minutes	2 1/8	0.698
6-18-60	1 Hour	5 1/2	1.353

TABLE II

Pressurizer Relief Valve (06-H15-10)

Date of Test	6-15-60
Time When Valve Popped	1434
Pressure When Valve Popped	2265 psig
Pressure When Valve Reseated	2190 psig
Reset Time	12.9 sec.

TABLE III

	Before Valve Popped	After Valve Popped
Average Temp. (F)	500	500.2
Reactor Press. (psig)	2260	2200
Pressurizer Temp. (F)	*653	*650
Pressurizer Level (in)	168	165
Valve Temperatures (F)		
Body (at Lower Adjusting Ring Set Screw)	210	270
Bonnet (at Tell-Tale Nipple)	140	149
Inlet Nipple (at Test Ring)	520	600+
Outlet Nipple (at Test Ring)	225	260

* Pressurizer Temp. Indicator was off-scale - The pressurizer temperatures before and after were calculated by assuming saturation temperatures at pressurizer pressures of 2260 and 2200 psig, respectively.

TEST RESULTS DLCS 3070102
T-641100-B
PRIMARY PLANT SELF-ACTUATED RELIEF VALVE OPERATION

Results Prepared By Jay F. Turnamian for RH

Results Reviewed By Roger J. Lawrence

Approved (Duquesne Light Company) George R. Santel Date 3-13-61