

## Troubleshooting of Lube Oil System Issue

**Customer:** ACEA Produzione SpA  
**Site:** Montemartini (Roma) – Italy  
**USN:** 809401 (TG1)

Prepared by

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Field Engineer

Approved by

Gabriele Fiore  
Outage manager

**This report may contain confidential and proprietary information subject to a confidentiality agreement.**

## Timers & Counters

Total Fired Hours: 5246.4  
Total Fired Starts: 1956  
Total Trps: 126

## Site Personnel

Name	Category	Role
Davide Quagliaroli	GE	Mechanical Field Engineer
Raimondo Kajat	FieldCore	Mechanical Supervisor
Joe Lamb	GE	Control Field Engineer
Raffaele Ballotta	OilSafe	Oil Specialist
Lorenzo Bensi	ACEA	Mech Maintenance
Silverio		

## Executive Summary

This report documents the planned call-out outage of unit 809401 (TG1) installed in Montemartini (Rome) Power Station owned by ACEA Produzione SpA.

Permit to work signed on : July 19th

Permit to Work signed off: July 23rd

On June 2018 some unit start-ups have been performed and it has been noted that the value of lube oil pressure required to run the unit drops while the mechanical driven lube oil pump start (@ 95% of the rated unit speed), this condition trigger "Low Lube Oil Pressure Switch 63QT-2A, 2B" and trip the unit - the Aux Lube Oil Pump (driven by 88QA-1 electrical motor) is restarted by the control system to bring the unit back to zero speed safely. This issue has been documented by the Power Service Case # 90330749.

The first action taken immediately after the happening were:

- check the condition of the main lube oil pump (mechanical driven) but no anomalies have been found
- adjust the pre-load of the VR-1 (LUBE OIL PRESSURE RELIEF VALVE) but without significant improvement

Here below, the list of the actions taken to troubleshoot the issue described above:

- inspect the VR-1 and replace it if found on bad condition
- check the calibration of 63QT-2A & 2B
- check the other components of the oil system

Note: the oil drained from the unit has been filtered @ NAS 6 before the tank refilling

### Auxiliary Lube Oil Check Valve

While disassembled the visual inspection of the Auxiliary Lube Oil Check Valve (pointed by red arrow in the attached schematic) showed heavy wear on pin mechanism the can drive the valve to get stuck on transient condition like at start-up.

The spare parts was not available and with customer agreement the check valve has been repaired on a local work shop and re-installed in the unit.

### Lube Oil Pressure Relief Valve (VR-1)

This valve has been found apparently in good condition and the customer decided to re-install it back in the unit.

### Oil Filtration & Oil Tank Condition

The lube oil has been filtered by OilSafe Company, the quality of the oil refilled in the unit was NAS 6.

The as found overall condition of the lube oil tank was good with negligible finding of dirty on the tank floor.

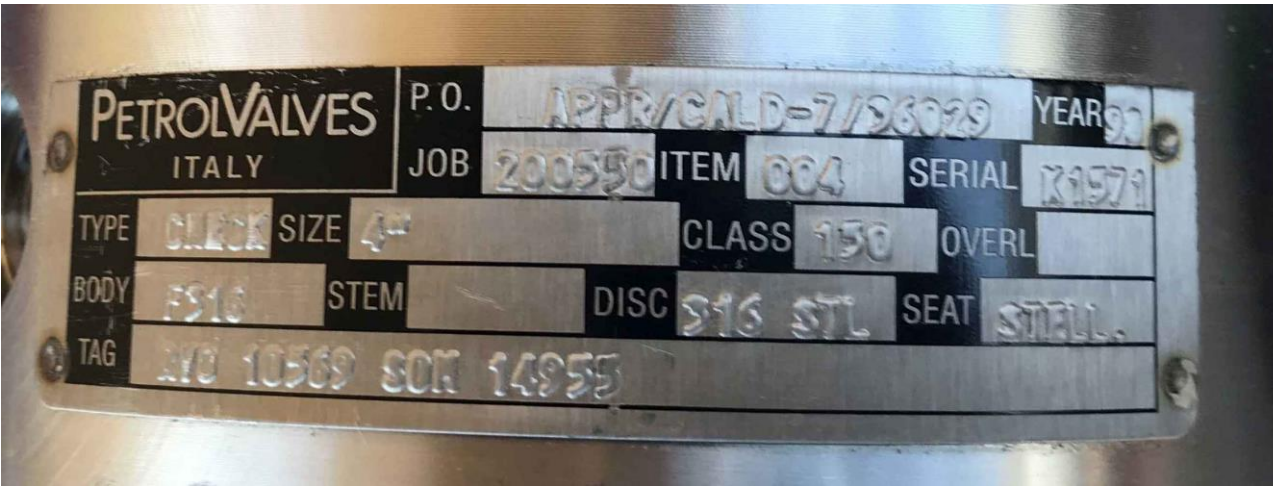
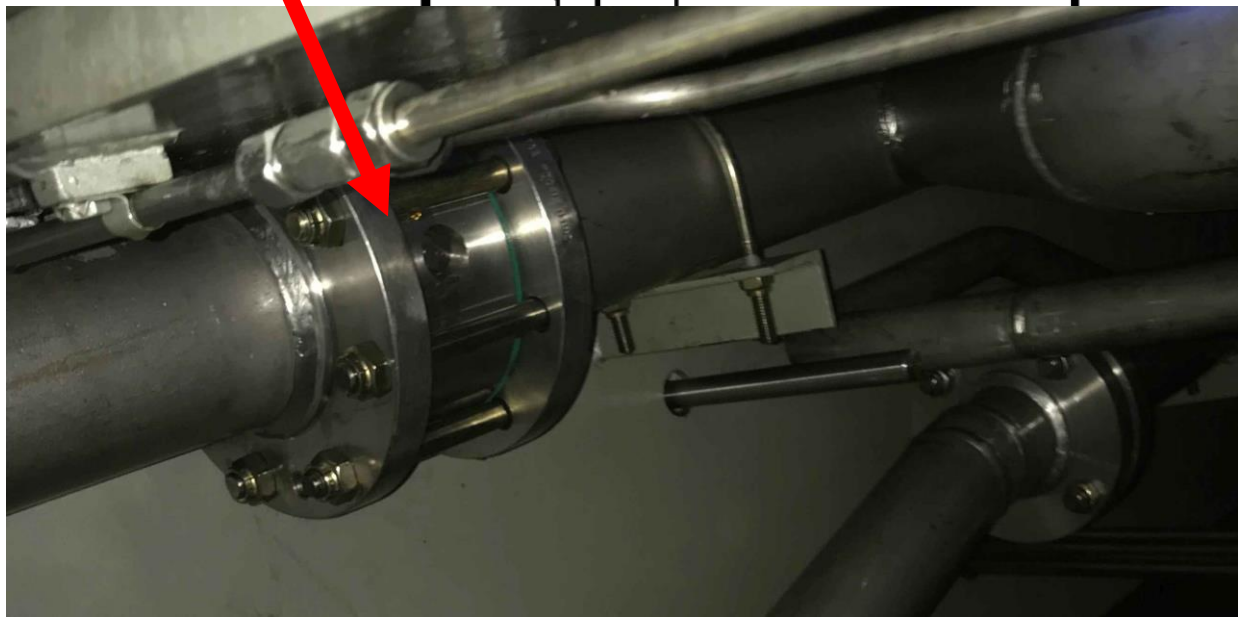
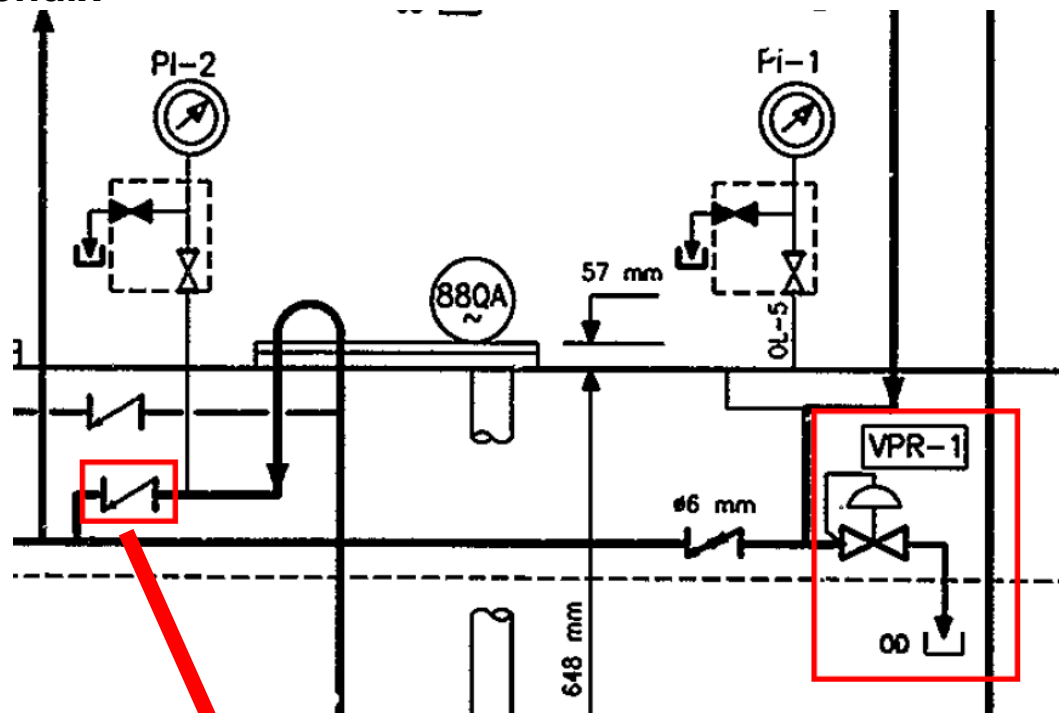
### **Unit Start Up Check**

To check the effectiveness of the check valve repair two unit starts have been performed, the first at FSNL and the second at 5-6 MW of load. At 95% of the rated unit speed the main lube oil pump (mechanical driven) has taken the duty of the unit and the maximum pressure at lube oil manifold was 3.8 – 3.9 bar. We try increase the pressure by adjusting the pre-load of the relief valve VR-1 but without significant results.

### **Conclusion**

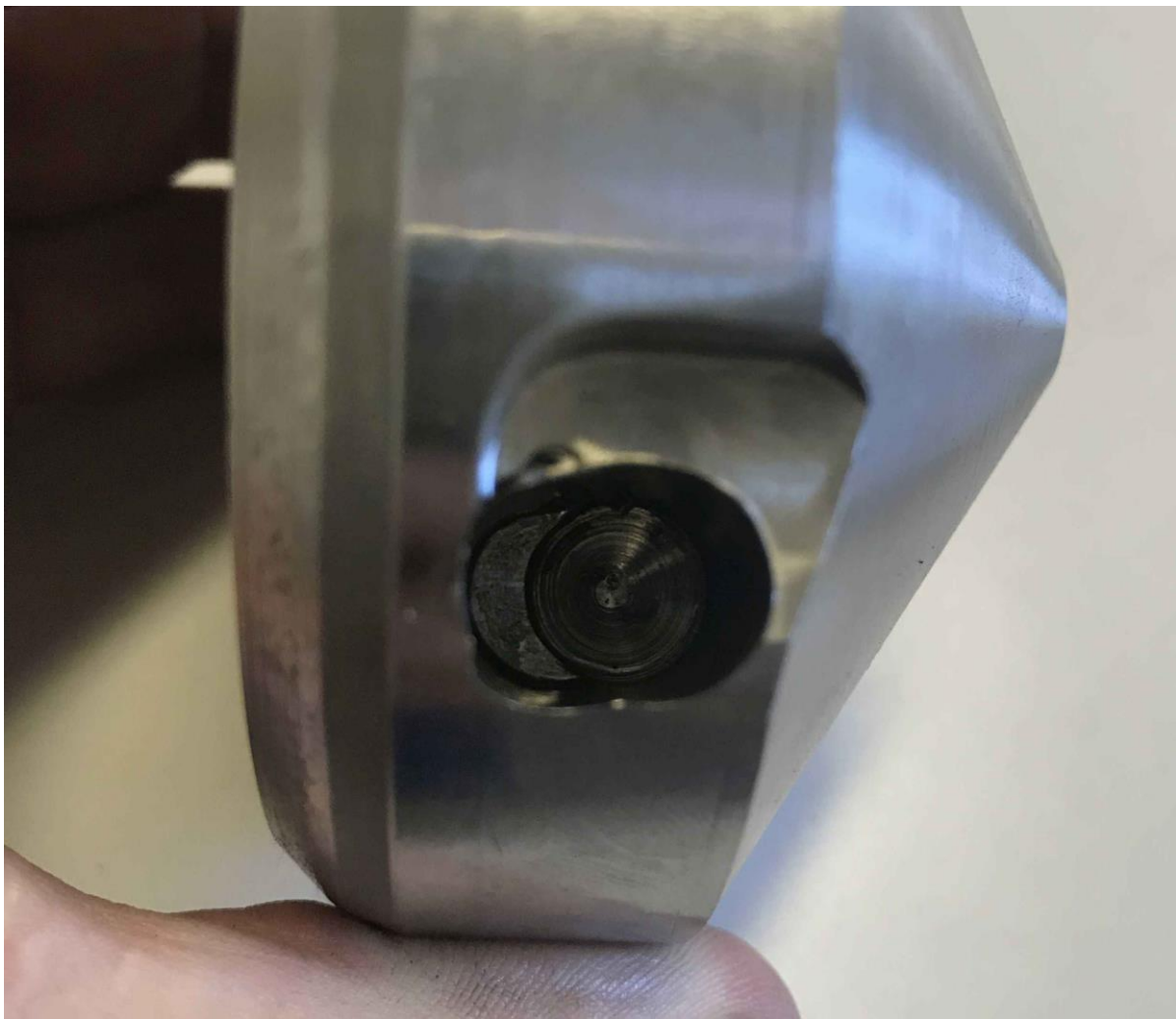
It has been decided by customer to postpone on September 2018 the replacement of both the auxiliary lube oil check valve with a new spare one and the replacement of relief valve VR-1.

Appendix













## Sistema Portatile di Diagnostica dei Fluidi - da ARTI

### Rapporto Analisi dell'Fluido PODSWare

Nome campione: OSPD260.18.001

Data di campionatura: 25/Jul/2018 15:51

Temperatura fluido: 29.6 °C

Portata: 50 ml/min

Viscosità: 44 cSt

Volume del campione: 10 ml

### Concentrazione delle Particelle

**ISO 4406**

**NAS 1638**

**Codice ISO:** 19/17/14 (4/6/14  $\mu\text{m(c)}$ )

**Classe NAS:** 9

<b>Dimensione [<math>\mu\text{m(c)}</math>]</b>	<b>Particelle/ml</b>
4	2,549.33
4.6	1,840.27
6	1,095.07
9.8	392.07
14	152.00
21.2	12.73
38	0.20
68	0.10

<b>Campo [<math>\mu\text{m}</math>]</b>	<b>Particelle/100 ml</b>
5 - 15	94,307
15 - 25	13,927
25 - 50	1,253
50 - 100	10
> 100	10

Firma del Tecnico: \_\_\_\_\_

Stampato: 7/25/2018 15:46





## Sistema Portatile di Diagnostica dei Fluidi - da ARTI

### Rapporto Analisi dell'Fluido PODSWare

Nome campione: OSPD260.18.001

Data di campionatura: 24/Jul/2018 12:11

Temperatura fluido: 28.1 °C

Portata: 50 ml/min

Viscosità: 41 cSt

Volume del campione: 10 ml

### Concentrazione delle Particelle

ISO 4406

NAS 1638

Codice ISO: 16/13/9 (4/6/14 µm(c))

Classe NAS: 6

Dimensione [µm(c)]	Particelle/ml
4	524.37
4.6	225.57
6	72.60
9.8	11.17
14	2.70
21.2	1.23
38	0.20
68	0.10

Campo [µm]	Particelle/100 ml
5 - 15	6,990
15 - 25	147
25 - 50	103
50 - 100	10
> 100	10

Firma del Tecnico: \_\_\_\_\_

Stampato: 7/25/2018 15:29