

Contractor's Guide

Outage 03 – 2018





**Alert/alarm number
+46 (0)491 78 66 66**

In case of fire:

**SAVE - WARN
ALERT - EXTINGUISH**

Main Control Room Unit O3

+46 (0)491-78 60 03

+46 (0)491-78 60 33

+46 (0)491-78 63 33

**The Work Permit Office,
ABH O3**

+46 (0)491-78 65 77

+46 (0)491-78 65 74

**OKG's Telephone
Exchange**

+46 (0)491-78 60 00

**Central Checkpoint,
Reception**

+46 (0)491-78 62 39

List of Contents

1	Welcome to unit O3	4
2	Major activities outage 2018	6
3	Opening hours and phone numbers	8
4	Scheduled outage period.....	12
5	Layout	14
6	Food and accommodation	16
7	System designations	18

The year's audit at O3 – safety is paramount

Welcome to one of the most important activities at Oskarshamn 3 (O3) in 2018: the annual audit. You matter to us, and we therefore



want to emphasise the fact that your safety is our top priority in this audit.

Over the course of the year, O3 has achieved stable production but has suffered fuel-related damage. During the 2017 audit, there were a number of accidents, incidents and quality defects, following which extensive work was carried out to reduce the risk of these accidents, incidents and defects from repeating. You are the key. We prevent accidents and quality failures from happening thanks to your commitment and safe working methods.

This year's maintenance audit will begin on 23rd August and will be completed on 18th September. This is a short 26-day audit involving a lot of planned work operations.

The audit will involve time-consuming work, including fuel leak testing, 641 and 677C voltage interruptions, servicing of rotary actuators, inspection and testing of the reactor tank with testing of support legs and the moderator tank stand and replacement of LPRM probes. Other major jobs include replacing rectifiers in 671 C and D, assembling a new 641 relay protection system and draining and inspecting cooling water ducts 112 L4, L5, L7 and L8.

Safeguarding the working environment and ensuring the safety of the plant depends on us taking full responsibility for the quality of our work in all situations.

We will be able to maintain a good working environment and keep our systems ship-shape by applying order and discipline in what we do. We quite simply prevent people, equipment and the environment from coming to any harm. Safety is always paramount. By sticking to well-established planning, we will never need to think about this priority.

A successful audit depends on all work being carried out with the right quality, ensuring secure productivity up to the 2019 maintenance audit.

See you on the plant!

Mats Ekblad, Production manager
Robert Linnsand, Head of Audit

2. Major works during the outage 2018

Reactor

- Testing core-shroud support
- Exchange of 8 pcs. LPRM-probes
- Testing Steam dryer /Core shroud
- Control rod drive service 5 pcs. Exchange 21 pcs control rod engines
- Primary system

Primary systems

- Preventive maintenance (total amount work orders)
- Exchange of 321 VB20

Turbine system

- Exchange EHS steering valves LT-turbine
- Exchange plate inside reheater (422)
- 112 L4, L5, L7, L8 drained for inspection

EI/I&C

- Exchange of rectifier 671 UC11/UC12 and UD11/UD12
- New relay protection 641 sub A-D
- Change valve actuator / switchgear plates 677 C
- Exchange 10 kV breaker
- Exchange of battery 672 BC2 and BD2

Your method for self-checking:



Stop

Improve the overall view,
increase the attention to details.



Think

Go through the task
and the anticipated results.



Act

Perform the carefully prepared task.



Reflect

Compare the actual
results to the anticipated results.



(K)Communicate

Tell your colleagues that the task has been
completed and how the work went.

3. Opening hours and phone numbers

The Work Permit Office (ABH) .. +46 (0)76-760 52 12
..... +46 (0)76-115 43 58
..... +46 (0)76-11 543 50

You collect work permits from the ABH, located in the P-building, floor 1.

Weekdays 07:00-20:00
Weekends..... 07:00-16:00

When the ABH is unattended, call the control room on phone no: +46 (0)491-78 63 33, +46 (0)491-78 60 33 or +46 (0)491-78 60 03

Robert Jonsson, ABH reaktor +46 (0)76-115 43 20
Mikael Adielsson, ABH turbin..... +46 (0)76-760 52 13

The Security Centre (BC) +46 (0)491-78 62 50
..... +46 (0)491-78 65 61
Open day and night

Central storage..... +46 (0)491-786345
Weekdays..... 07:30-20:00
Weekends..... 07:30-16:00

Checkpoint/reception desk +46 (0)491-78 62 39
The security checkpoint/reception desk is located in the entrance building (BVB).

Weekdays.....07:00-16:30

Electrical disconnections..... +46 (0)72-730 86 56

Monday –Thursday.....07:30-18:00

Friday.....07:30-16:00

Weekends.....07:30-16:00

Occupational Health Service +46 (0)491-696 41

The occupational health service is located in the house of Gottfrid in the Simpevarp village, within OKG's industrial area.

Monday08:00-12:00

Tuesday - Thursday08:00-15:00

IT support..... +46 (0)491-78 61 13

Weekdays.....07:30-16:30

Mechanical storage +46 (0)491-78 65 22

The mechanical storage is located in the N-building in the active area floor 1, and also in the non-active area floor 2, where you can borrow tools and equipment.

Weekdays.....07:30-19:00

Weekends.....07:30-16:00

Key Centre... +46 (0)491-78 88 83, +46 (0)70-344 96 30

If you need a key in order to have access to your workplace, you must sign for and return the keys at the key centre every day, located at the main entrance at O3. In order to sign for a key you must present a valid work permit.

Weekdays.....06:00-22:00

Weekends.....06:00-18:00

Outage office

At the outage office are found the functional group leaders, planning personnel, and other service and information functions. The outage office is located in the P-building, floor 2.

Weekdays.....07:30-16:00

Weekends.....08:00-12:00

Service centre +46 (0)491-78 76 00

You can turn to the service centre if you have any questions about for instance clean systems/FME (foreign material exclusion), transports, temporary lighting, decontamination, scaffolds, or if you need to fault report elevators and overhead travelling cranes. The service centre is located in the P-building in the active area, floor 1.

Open day and night

Radiation Protection..... +46 (0)491-78 66 36

The radiation protection personnel will help you if you need any advice or information about radiation protec-

tion, work environment and fire prevention. There is a radiation protection office in the turbine plant, located in the D-building by the generator, floor 4. Safety permits for work in the active area can be collected at the reception desk in the P-building inside the revolving gates on floor 1, and safety permits for work in the non-active area can be collected in the P-building floor 3.

Open day and night

Temporary power and lighting

Weekdays.....	07:30-16:00
.....	+46 (0)72-715 87 10
Weekdays	16:00-20:00
.....	+46 (0)76-762 36 18
Weekends	07:30-16:00
.....	+46 (0)76-762 36 18

The Admission Group

The admission group can provide information and offer support on issues concerning the admission to OKG.

Helena Vesterlund Gärdinge,

Security Administrator +46 (0)76-115 43 80

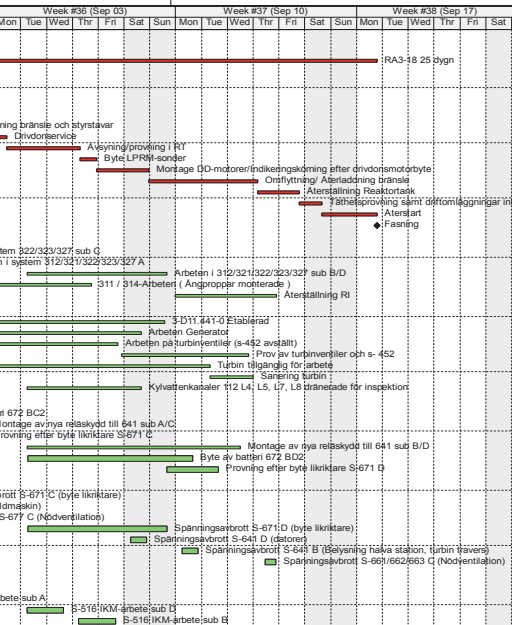
Transport centre	+46 (0)491-78 63 77
Weekdays	07:30-19:00
Weekends.....	07:30-16:00

4. Scheduled outage period

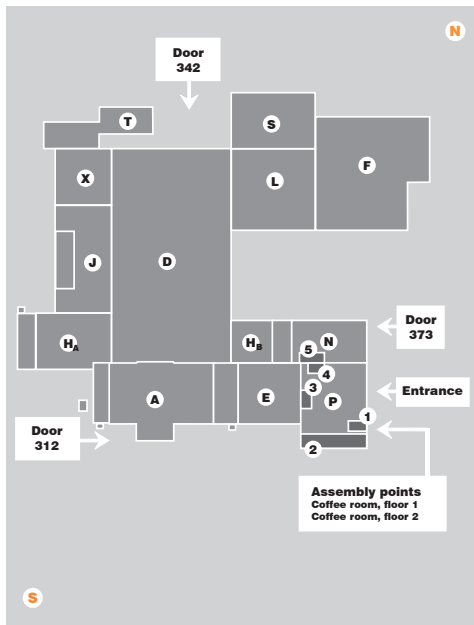
03 Revisionsavställning 2018...

RA3-18 LT02 H

Start	Finish	34 (Aug 20)				Week #35 (Aug 27)							
		Thr	Fri	Sat	Sun	Mon	Tue	Wed	Thr	Fri	Sat	Sun	
Kritisk linje		<ul style="list-style-type: none"> 23-Aug-18 20:00 - 17-Sep-18 19:00: ♦ Utlösning av TS (Generator från nät) 23-Aug-18 20:00 - 24-Aug-18 07:00: Nergång/Kylining RT 23-Aug-18 21:00 - 26-Aug-18 17:00: Etablering Reaktortank 24-Aug-18 07:00 - 27-Aug-18 14:00: Sippning bränsle 26-Aug-18 17:00 - 28-Aug-18 06:00: Uraddning bränsle 27-Aug-18 14:00 - 30-Aug-18 06:00: Uraddning bränsle 28-Aug-18 14:00 - 01-Sep-18 19:00: Uraddning bränsle 28-Aug-18 21:00 - 03-Sep-18 11:00: Uraddning bränsle 30-Aug-18 20:00 - 06-Sep-18 07:00: Uraddning bränsle 01-Sep-18 19:00 - 08-Sep-18 23:00: Uraddning bränsle 03-Sep-18 11:00 - 13-Sep-18 04:00: Uraddning bränsle 06-Sep-18 07:00 - 14-Sep-18 19:00: Uraddning bränsle 06-Sep-18 23:00 - 15-Sep-18 16:00: Uraddning bränsle 08-Sep-18 23:00 - 17-Sep-18 19:00: Uraddning bränsle 13-Sep-18 04:00 - 17-Sep-18 19:00: Uraddning bränsle 14-Sep-18 19:00 - 17-Sep-18 19:00: Uraddning bränsle 15-Sep-18 16:00 - 17-Sep-18 19:00: Uraddning bränsle 											
Reaktorsystem		<ul style="list-style-type: none"> 25-Aug-18 06:00 - 31-Aug-18 17:00: Arbeten i system 27-Aug-18 06:00 - 01-Sep-18 17:00: Arbeten i system 04-Sep-18 06:00 - 09-Sep-18 16:00: Arbeten i system 26-Aug-18 22:00 - 06-Sep-18 18:00: Arbeten i system 10-Sep-18 00:00 - 13-Sep-18 22:00: Arbeten i system 											
Turbin-/hjälpsystem		<ul style="list-style-type: none"> 27-Aug-18 06:00 - 09-Sep-18 14:00: Arbeten i system 27-Aug-18 06:00 - 08-Sep-18 16:00: Arbeten i system 27-Aug-18 23:00 - 07-Sep-18 18:00: Arbeten i system 07-Sep-18 22:00 - 12-Sep-18 20:00: Arbeten i system 23-Aug-18 23:00 - 11-Sep-18 08:00: Arbeten i system 11-Sep-18 08:00 - 13-Sep-18 00:00: Arbeten i system 04-Sep-18 06:00 - 08-Sep-18 16:00: Arbeten i system 											
EI/instrument		<ul style="list-style-type: none"> 24-Aug-18 07:00* - 31-Aug-18 16:00: Byte av batterier 25-Aug-18 06:00 - 02-Sep-18 16:00: Mätning 31-Aug-18 16:00 - 02-Sep-18 16:00: Mätning 04-Sep-18 06:00 - 12-Sep-18 12:00: Mätning 04-Sep-18 07:00* - 10-Sep-18 16:00: Mätning 09-Sep-18 16:00 - 11-Sep-18 16:00: Mätning 											
Spänningsavbrott		<ul style="list-style-type: none"> 24-Aug-18 07:00 - 31-Aug-18 16:00: Spänningsavbrott 28-Aug-18 06:00 - 28-Aug-18 21:00: Spänningsavbrott S-64 C (läs) 30-Aug-18 06:00 - 30-Aug-18 20:00: Spänningsavbrott 04-Sep-18 07:00* - 09-Sep-18 16:00: Spänningsavbrott 08-Sep-18 06:00 - 08-Sep-18 21:00: Spänningsavbrott 10-Sep-18 06:00* - 10-Sep-18 21:00: Spänningsavbrott 13-Sep-18 11:00 - 13-Sep-18 21:00: Spänningsavbrott 											
Säkerhets IKM		<ul style="list-style-type: none"> 27-Aug-18 06:00 - 29-Aug-18 16:00: S-516:IKM-arbete:sub C 30-Aug-18 06:00 - 31-Aug-18 16:00: S-516:IKM-ar 04-Sep-18 06:00* - 05-Sep-18 16:00: S-516:IKM-ar 06-Sep-18 06:00* - 07-Sep-18 16:00: S-516:IKM-ar 											



5. Layout O3



Important locations

1. Key centre and locker service centre, floor 1
2. Outage office, floor 2
3. Work permit office (ABH), floor 1
4. Service centre, floor 1 active area
5. Mechanical storage, floor 1 active area, floor 2 non-active area

Structural parts

- A Reactor containment
- D Turbine building
- E Control building
- F Waste facility
- HA Auxiliary systems building A
- HB Auxiliary systems building B
- J Cooling water system building
- L Off-gas treatment building
- N Workshop building
- P Entrance building
- S Service systems building
- T Transformer building
- X High-voltage switchgear building

6. Food and accommodation

Restaurant Simpan..... +46 (0)491-78 67 86

Restaurant Simpan is located within the monitored area, between O3 and O1/O2.

Weekdays..... 11:00-12:30

Weekends..... 11:00-12:30

At our company restaurant Simpan you can pay in a couple of different ways. You can either purchase a prepaid card which can be found at the register at Simpan or in one of the kiosks situated on the property or you can chose to pay with a debit/credit card.

During the revision, Simpan will be very busy from 11:00-11:30. If possible, please try to pick a different time to enjoy your lunch.

Kiosk O3 +46 (0)76-144 01 31

The kiosk at O3 is located at the entrance floor, just outside the auditorium.

Weekdays..... 08:30-20:00

Weekends..... 08:30-15:30



The following options are also available:

- Hot dogs can be purchased in connection to the kiosk
- Vending machines are found on the ground floor
- Microwaves are located in connection to the cafeterias on the ground floor
- Vending machines with warm and cold drinks, biscuits and sweets are located in connection to the canteen at unit O3 for use 24 hours a day.

The security guards on duty can be contacted after-hours if you wish to buy frozen food, on phone no. 0491-78 62 50.

Restaurant Sörågården +46 (0)491-76 78 78

Restaurant Sörågården is located within the industrial site in Söråbyn outside the monitored area.

Weekdays..... 11:15-13:00

Order in advance is required by 09:30 at the latest the same day as you wish to have lunch!

Söråbyn's Accommodation Office... +46 (0)491-78 61 91

Monday, Tuesday, Wednesday, Friday 07:30-16:00

Thursday..... 07:30-17:00

7. System designations

2 Reactor vessel and auxiliary equipment

211 Reactor pressure vessel

221 Control rod drives

222 Control rods

3 Reactor process systems

311 Main steam lines

312 Feed water lines

313 Reactor recirculation system

314 Pressure relief system

316 Condensation system

321 Residual heat removal system

322 Containment spray system

323 Emergency core cooling system

324 Pool water cooling and clean-up system

327 Auxiliary feedwater system

328 Excess feedwater system

331 Reactor water clean-up system

332 Condensate clean-up system with precoat filters

336 System for sampling and analysis

341 Off-gas treatment delay system

342 Liquid waste system

343 Solid waste system

345 Controlled area flow drain system

346 Drain system for fuel caskets

348 Recombiner system

349 Active waste gas purification system

351 Boron injection system

352 Drain system for monitored leakage

354 Hydraulic scram system

358 Water-transfer from wetwell to drywell

- 361 Containment pressure relief system, atmosphere
- 362 Containment pressure relief system via scrubber

4 Turbine plant

- 403 Turbine
- 405 Generator
- 407 Generator voltage regulator
- 412 Bearing and jacking oil system
- 416 Seal oil system
- 421 Turbine plant main steam system
- 422 Steam reheating system
- 423 Steam extraction system
- 424 Gland seal and leakage steam system
- 431 Turbine building air-cooling system
- 433 Turbine building floor drain system
- 441 Main cooling water system
- 445 Generator cooling system
- 452 Governing oil system
- 461 Condenser and vacuum system
- 462 Condensate system
- 463 Turbine plant feedwater system
- 464 Reactor coolant make-up system
- 472 Drain and drying system
- 473 Sealing water system
- 477 Turbine plant sampling system
- 481 Hydrogen and carbon dioxide system

5 I&C Equipment

- 592 Turbine protection system
- 593 Turbine plant process measurement and automatic process control
- 594 Turbine plant supervision system
- 595 Turbine plant automatic operation system
- 596 Turbine vibration measurements
- 597 Turbine governor

6 Electrical Power Systems

- 611 Main transformer
- 612 Plant auxiliary transformer
- 613 Generator bus assembly
- 614 Generator bus cooling system
- 615 Generator switching device
- 616 Generator switch cooling system
- 617 Generator switch compressed air system
- 618 Start-up transformer
- 622 400 kV-Switchgear
- 624 130 kV- Switchgear
- 628 10 kV- Switchgear (KYB)
- 641 General 10 kV system
- 643 General >660 V system
- 644 General <400 V (excluding turbine plant)
- 645 General >400 V (turbine plant)
- 646 General <400 V (turbine plant)
- 649 Frequency converters
- 651 Diesel engines
- 652 Diesel engines auxiliary systems
- 653 Diesel-generator and auxiliary systems
- 654 I&C for stand-by, AC power plant
- 655 Air start-up system

- 656 Diesel fuel oil system
- 661 Diesel-backed switch gear, 10 kV
- 662 Diesel-backed switch gear, >400 V (excluding turbine plant)
- 663 Diesel-backed switch gear, <400 V (excluding turbine plant)
- 664 I&C for diesel-backed, AC power
- 666 Diesel-backed switch gear, <400 V (turbine plant)
- 671 Battery-backed DC-system >220 V
- 672 Battery-backed DC-system 110 V
- 673 Battery-backed DC-system ± 24 V
- 677 Battery-backed AC-system ≤ 400 V
- 681 Control system for electrical power system/supply

7 Service systems

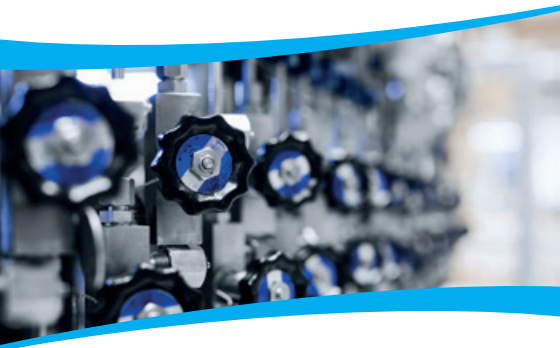
- 711 Screening plant
- 712 Shut-down cooling water system
- 713 Normal operation cooling water system for priority demands
- 714 Normal operation cooling water system for non-priority demands
- 718 Diversified shut-down cooling water system
- 721 Shut-down secondary cooling water system
- 722 Secondary cooling water system for system 331
- 723 Normal operation secondary cooling water system for priority demands
- 724 Normal operation secondary cooling water system for non-priority demands
- 725 Containment gas cooling system
- 726 Air conditioning distribution system
- 727 Air cooling system
- 728 Diversified shut-down secondary cooling water system

- 733 Demineralised water distribution system
- 734 High pressure purge water system
- 735 Processed demineralised water distribution system
- 741 Reactor containment gas treatment system
- 742 Reactor building ventilation system
- 743 Waste building ventilation system
- 744 Turbine building ventilation system
- 745 Ventilation system for other controlled areas
- 746 Control building ventilation system
- 747 Ventilation system for diesel-, auxiliary systems- and high voltage switch gear buildings
- 748 Ventilation system for other non-controlled areas
- 749 Reactor building stand-by filter system
- 751 Compressed air system for priority demands
- 753 Compressed air system for non-priority demands
- 754 Compressed nitrogen system
- 755 Gas treatment system for containment atmosphere
- 758 Distribution of oxygen, acetylene, argon, LPG, nitrous oxide (laughing gas)
- 761 Service water distribution system
- 763 Heating system
- 764 Boiler plant
- 765 Non-controlled area floor drain system
- 766 Sewage system
- 767 Ground water drain system
- 768 Day water system
- 772 Shelter ventilation system
- 778 Containment leak tightness and pressure testing

8 Other Plant Equipment

- 811 Overhead cranes
- 812 Elevators

- 813 Other lifting equipment
- 814 Engine operated doors and locks
- 815 Transport vehicles
- 822 Equipment for personnel decontamination
- 823 Active workshop equipment
- 824 Transport radiation shields
- 831 Indoor lights and power outlets
- 832 Outdoor lights and power outlets
- 834 Diesel backed lighting system
- 835 Emergency lighting system
- 840 Fibre optic transmission
- 841 Local and intercom telephone network
- 843 Alarm system
- 844 Pagers, beepers
- 845 Public speaker system
- 846 Time system
- 848 Radio communication system
- 851 Carrier frequency system
- 852 Wireless equipment
- 853 Special telephone switch board
- 854 Remote indication and measurement
- 860 Portable fire extinguishers
- 861 Fire fighting water system
- 862 Water sprinkler system for cable areas
- 863 Foam extinguishing system
- 864 Fire-fighting water system, turbine plant
- 865 Water sprinkler system for turbine plant
- 866 Gas extinguishing system
- 868 Fire ventilation system
- 869 Fire alarm
- 881 Indication of power production units 1, 2, 3 and 8
- 891 DRUS - Plant Operation Follow-up System



OKG AB

572 83 Oskarshamn, phone no. +46 (0)491-78 60 00