

2017 Laguna Verde NPP Dose Results

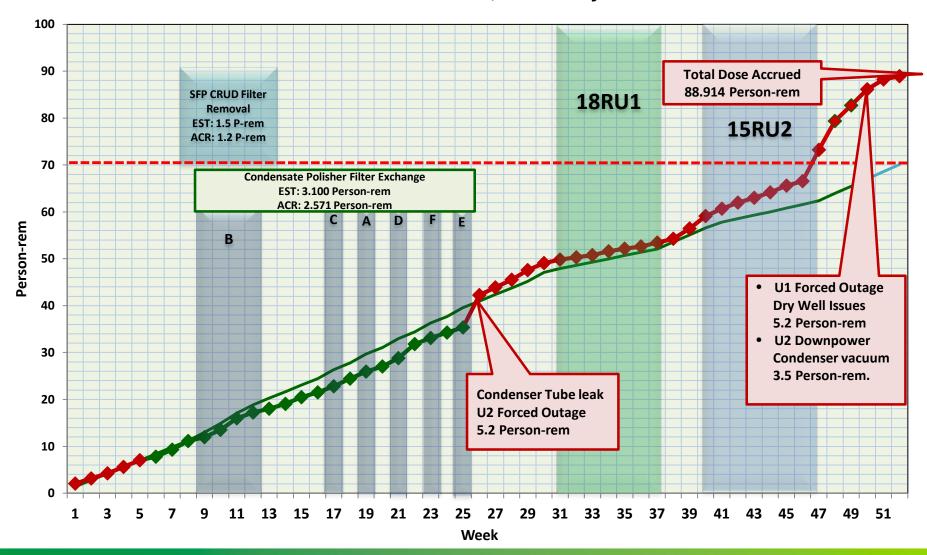
CNLV



Online Dose



Initial Dose Goal: 70 Person -rem / Final Projection: 89 Person-rem



Recargas

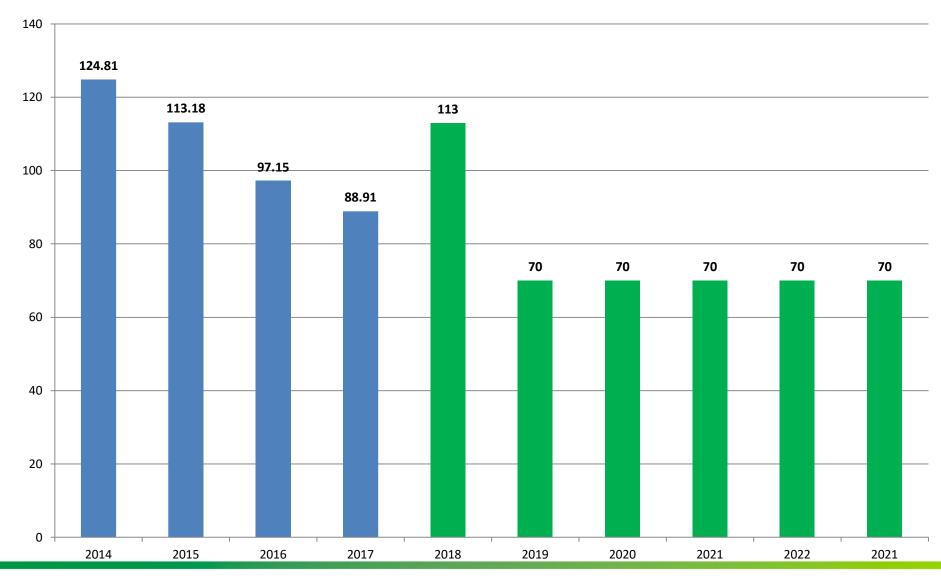
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2

Dirección Corporativa de Operaciones

Gerencia de Centrales Nucleoeléctricas

ONLINE DOSE



0

2

2



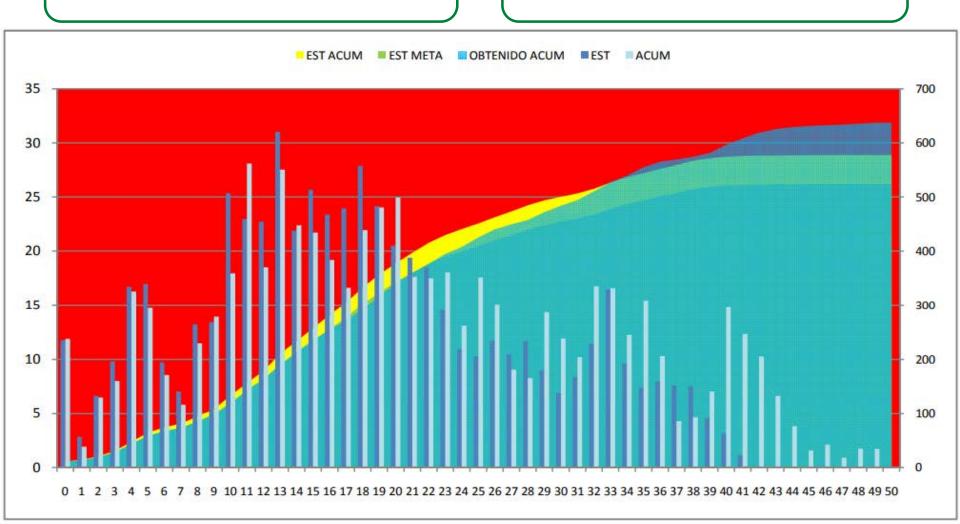
Outage Dose

Gerencia de Centrales Nucleoeléctricas

Estimated Dose: 524 Person-rem

Dose Goal: 489 Person-rem

Accrued Dose: 642 Person-rem



18RU1

Dirección Corporativa de Operaciones

Gerencia de Centrales Nucleoeléctricas

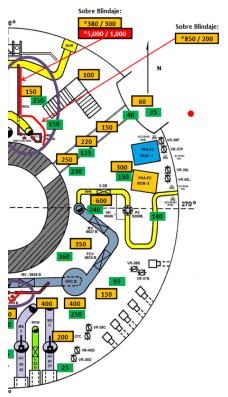
17RU1 Radiation fields to estimate dose

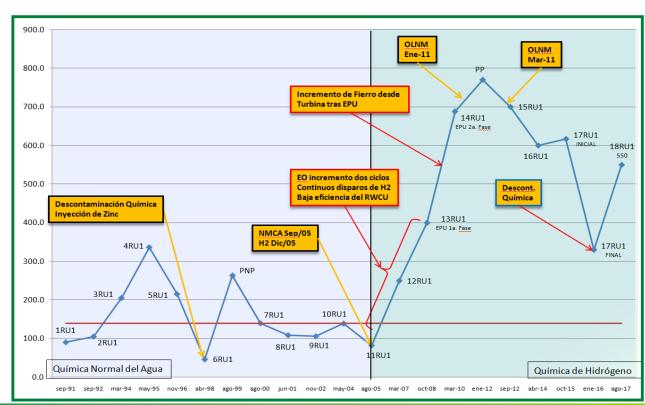
18RU1 Radiation fields found

Dry Well dose rate 40% higher than expected.

Contributing within 30 days before Outage 2 SCRAMS occurred July 4 and 22

New Dose Projection: 710 P-rem







18RU1 Collective Dose

Dirección Corporativa de Operaciones

Gerencia de Centrales Nucleoeléctricas

Initial
Estimated
Dose:
524 P-rem

Problems

Dry Well dose rate 40% higher than expected.



Implemented actions to reduce Dose

- •Comference with INPO RP and Chemistry
- •Aditional flushings on RRC, RWCU y RHR
- •Delay work for better conditions (clean water pipe fills, shieldings, decay, and flushings)
- •Additional Shelding installation
- Hot Spot removal
- •Dry Well access control for each entry (Crew size, time required, work interference)

Total Dose Accrued: 642 P-rem

15RU2

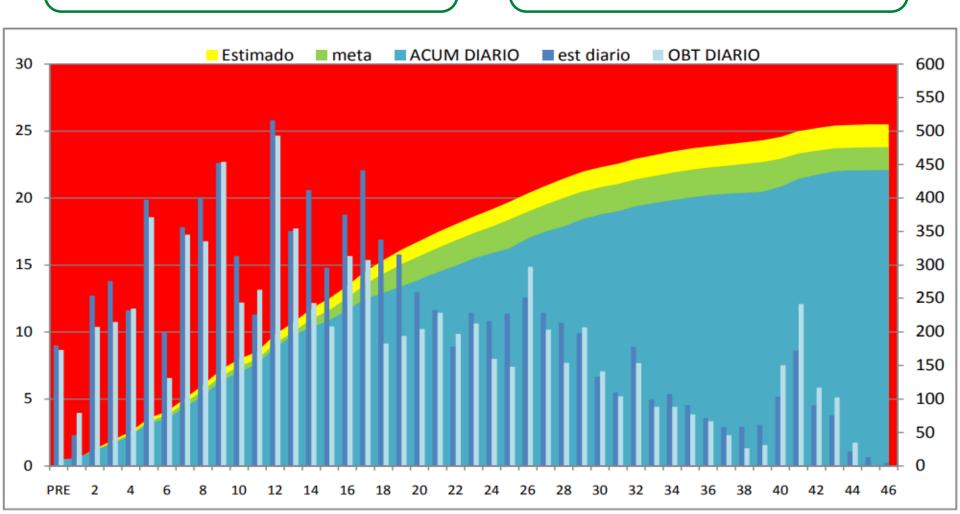
Dirección Corporativa de Operaciones

Gerencia de Centrales Nucleoeléctricas

Estimated Dose: 510 Person-rem

Dose Goal: 477 Person-rem

Accrued Dose: 447 Person-rem



15RU2

Gerencia de Centrales Nucleoeléctricas

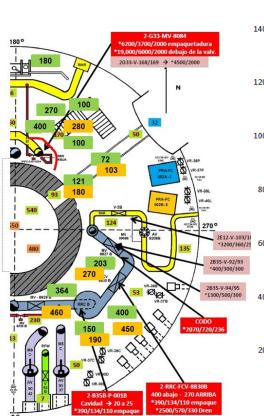
Radiation fields to **14RU2**

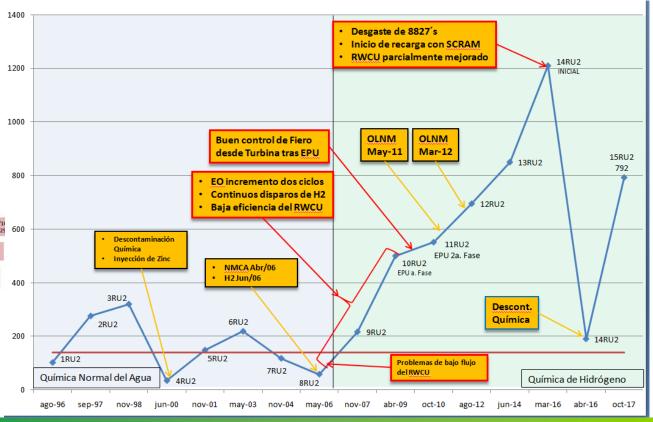
estimate dose

Radiation fields found

Dry Well dose rate 20% higuer than expected. No SCRAMS contributing

New Dose Projection: 485 P-rem







DOSIS COLECTIVA 15RU2

Dirección Corporativa de Operaciones

Gerencia de Centrales Nucleoeléctricas

Initial
Estimated
Dose:
510 Rem

Dry Well dose rate 20% higuer than expected.



New Dose Projection: 485 Rem

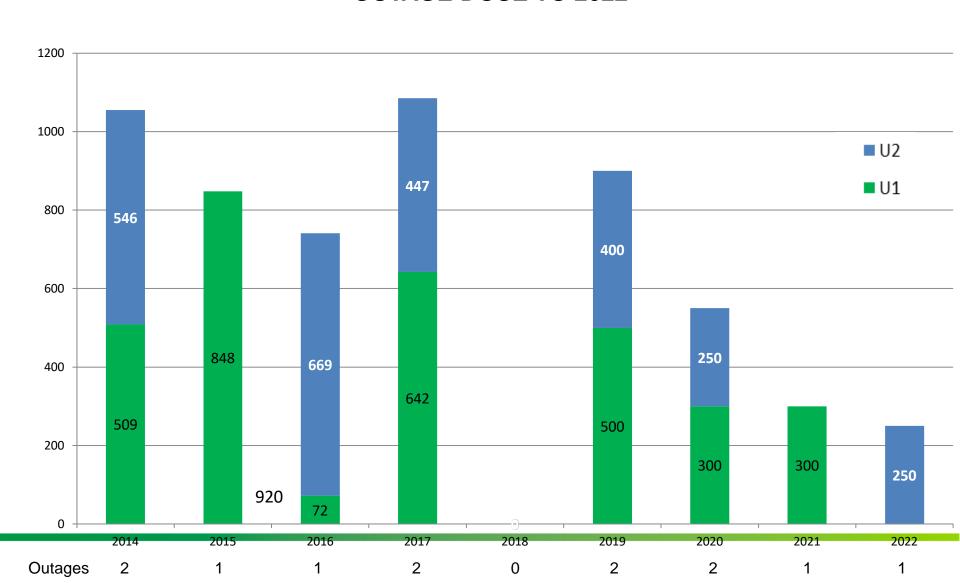
Actions to reduce Dose

- •Dry Well access control for each entry (Crew size, time required, work interference)
- •Cammeras and Telemetry Control Center
- •Aditional flushings on RRC, RWCU y RHR
- •Delay work for better conditions (clean water pipe fills, shieldings, decay, and flushings)
- •Additional Shelding installation
- Hot Spot removal

Total Dose Accrued: 447 P-rem



OUTAGE DOSE TO 2022





SOURCE TERM REDUCTION IMPLEMENTED ACTIONS

- Chemical decontamination + Pasivation.
- Valves elemental cobalt removal after maintenance activities.
- Out core stellite components replacements (Feedwater Valves).
- In core stellite components replacements (Jet Pump Wedges).
- DTS fltration system during outage. (LaSalle benchmark)
- Submersible Demineralizer Filters During Outage.



SOURCE TERM REDUCTION PLANNED ACTIONS

- Ultrasonic fuel cleaning next 2019 outage for both 19RU1 y 16RU2. (LaSalle benchmark).
- Chemical decontamination next 2020 for both 20RU1 y 17RU2. (working to get it done on 2019 with HE-UFC)
- Suppression pool vacuuming next 2019 outage for both 19RU1 y 16RU2.

Continue benchmarking Industry



COBALT 58 CONTRIBUTION

During previous cycles 18C1 y 15C2 Co-58 was detected on reactor water, during 2017 outages the contribution of Co-58 on oxide layer was as much as 40%.

On 2010-2011 the Cross Under pipes were recovered with Inconell-625 to reduce wearing issues. The Inconell-625 is a nickel-chromium alloy, nickel once activated decays on Co-58.

Engineering starts analizing actions to stop incorporing nickel to reactor water for source term and fuel reliability concerns.

Gamma Scan will be perform this week



Gerencia de Centrales Nucleoeléctricas

Questions