PSB-TF recommendations - implementation follow-up - Corrosion

Recommendation #5 (ST-2) – S. Deleval – EN-CV

2024-05-30

Reference (https://indico.cern.ch/event/1420435/)

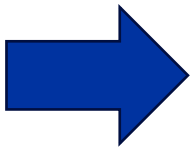
Recommendation #5

Maintain a high level of awareness of the consequences of accidental pollutions on the magnets in the team carrying out the maintenance of the cooling circuits to reduce the risk of accidental pollution. Interact proactively with EN Coordination and EN-CV link persons to ensure that appropriate awareness is given to all teams intervening in water circuits.

- **Communication including the Contractors following the task force.**
- **Technical meeting related to water quality and water treatment.**
- **Many actions already in place since LS2 and previous pollution. For example:**
  - Integration of the past experiences for the technical specifications of the new frame contracts.
  - Modification of the PS, SPS and LHC circuits to avoid injection of resins in the circuits (additional modification to be implemented in the coming year)

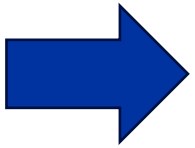
Actions

- **Water analysis with a detection limit decreased from 1,6 ppm to 0,2 ppm**



  - **Samples taking by EN-CV**
  - **RP measurement**
  - **Analysis performed by an external laboratory (Via CV Water Treatment contract)**

- **After filtration of the water, analysis of the suspender matter by Automatic Particles Analysis**



  - **Samples taking by EN-CV**
  - **RP measurement**
  - **Analysis performed by EN-MME**

LHC

IMPACT	LHC Sites	Circuits	Sample volume	TREC	Dates of the sample taking	RP analysis	Date to get back the samples (to CV)	Sulfur S	Copper	Iron	Zinc	
								ppm	ppm	ppm	ppm	
215811	P1	USA15 Magnet DUMP	1L	CR-140739	25 August 2023	ok	01 September 2023	<0.2	<0.005	<0.005	0.06	
216070	P2	ED TI2	1L	CR-142561	25 August 2023	ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED Secteur 2-3	1L	CR-142563		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED Secteur 1-2	1L	CR-142559		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED Dipole	1L	CR-142560		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED Solenoide L3	1L	CR-142562		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
216070	P4	ED Secteur 4-5	1L	CR-142201	25 August 2023	ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED Secteur 3-4	1L	CR-142202		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED RF right	1L	CR-142200		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ED RF left	1L	CR-142199		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
216071	P5	BUSBAR	2*1L	CR-141816	28 August 2023	ok	01 September 2023	<0.2	0.227	<0.005	0.04	X
		ECAL	2*1L	CR-141813		ok	01 September 2023	<0.2	<0.005	<0.005	<0.01	
		ENDCAP	2*1L	CR-141815		ok	01 September 2023	<0.2	<0.005	0.292	0.03	X
		Muon	2*1L	CR-141814		ok	01 September 2023	<0.2	<0.005	0.038	0.02	X
		YOKE	2*1L	CR-141817		ok	01 September 2023	<0.2	<0.005	0.128	0.06	X
216356	P6	ED secteur 6-7	2*1L	CR-141713	06 September 2023	ok	21 September 2023	<0.2	0.057	0.0015	0.06	
		ED secteur 5-6	2*1L	CR-141712		ok	21 September 2023	<0.2	0.015	0.01	0.01	
216356	P8	ED TI8	2*1L	CR-152115	06 September 2023	ok	21 September 2023	<0.2	<0.001	<0.001	<0.001	
		ED Secteur 8-1	2*1L	CR-152117		ok	21 September 2023	<0.2	<0.001	0.0017	0.0055	
		ED Secteur 7-8	2*1L	CR-152116		ok	21 September 2023	<0.2	<0.001	<0.001	<0.001	
		ED LHCb	2*1L	CR-152114		ok	21 September 2023	<0.2	<0.001	0.007	<0.001	

SPS - NA

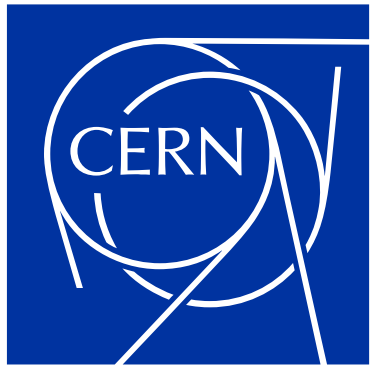
IMPACT	SPS Sites	Sample volume	Dates of the sample taking	RP analysis	Date to get back the samples (to CV)	Sulfur S	Copper	Iron	Zinc	
						ppm	ppm	ppm	ppm	
PT1	BA1 - ED	2*1L	08 November 2023	Ok	30 November 2023	<0.2	<0.005	<0.005	<0.01	
PT2	BA2 - ED	2*1L	08 November 2023	Ok	30 November 2023	<0.2	<0.005	<0.005	<0.01	
	BA2 - SEPTA	2*1L	08 November 2023	Ok	30 November 2023	<0.2	<0.005	<0.005	<0.01	
PT3	BA3 - ED	2*1L	08 November 2023	Ok	30 November 2023	<0.2	<0.005	<0.005	<0.01	
	BB3 - ED	2*1L	08 November 2023	Ok	30 November 2023	Uncertainties on the sample				X
PT4	BA4 -ED	2*1L	08 November 2023	Ok	30 November 2023	<0.2		<0.005	<0.01	
	BA4 - SEPTA	2*1L	08 November 2023	Ok	30 November 2023	<0.2	<0.005	<0.005	<0.01	
PT5	BA5 - ED	2*1L	08 November 2023	Ok	30 November 2023	<0.2	<0.005	<0.005	<0.01	
PT6	BA6-ED	2*1L	08 November 2023	Ok	08 December 2023	<0.2	<0.005	<0.005	<0.01	
	BA6 - SEPTA	2*1L	08 November 2023	OK	08 December 2023	<0.2	0.045	2.52	0.02	X
PREVESSIN	BA80	2*1L	17 May 2024	Ongoing						
	BA81	2*1L	17 May 2024	Ongoing						
	BA82	2*1L	17 May 2024	Ongoing						

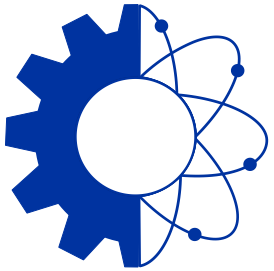
CPS

IMPACT	Machines	Sample volume	Dates of the sample taking	RP analysis	Date to get back the samples (to CV)	Comments	Sulfur S	Copper	Iron	Zinc	
							ppm	ppm	ppm	ppm	
PS	PS – Main magnet	**2*1L**	09 November 2023	ok	09 November 2023		<0.2	<0.005	0.01	<0.01	
	PS - PS -TT2	**2*1L**	09 November 2023	ok	09 November 2023		<0.2	0.013	0.017	<0.01	
	PS- zone est	**2*1L**	09 November 2023	ok	09 November 2023		<0.2	<0.005	<0.005	<0.01	
PSB	BOOSTER – Surface	**2*1L**	20 November 2023	ok	20 November 2023		<0.2	0.007	<0.005	<0.01	
	BOOSTER - tunnel	**2*1L**	20 November 2023	ok	20 November 2023		<0.2	0.008	<0.005	<0.01	
	245 - ED hall	**2*1L**	20 November 2023	ok	20 November 2023		<0.2	<0.005	0.014	<0.01	
	245-magnet	**2*1L**	20 November 2023	ok	20 November 2023		<0.2	0.029	0.026	<0.01	
LINAC 4	LINAC 4 – RFQ 1	**2*1L**	23 November 2023	ok	23 November 2023		<0.2	<0.005	0.016	<0.01	
	LINAC 4 – RFQ 2	**2*1L**	23 November 2023	ok	23 November 2023		<0.2	<0.005	0.006	<0.01	
	LINAC 4 – Tunnel	**2*1L**	23 November 2023	ok	23 November 2023		<0.2	0.014	0.015	<0.01	
	LINAC 4 – Transfer line	**2*1L**	23 November 2023	ok	23 November 2023		<0.2	0.018	0.019	0.02	
	LINAC 4 - Klystron	**2*1L**	23 November 2023	ok	23 November 2023		<0.2	0.075	<0.005	<0.01	
LEIR	234	**2*1L**	13 November 2023	ok	13 November 2023		<0.2	0.021	0.005	<0.01	
CTF3	CTF3	**2*1L**	14 November 2023	ok	14 November 2023		<0.2	0.017	0.020	<0.01	
AD	AD	2*1L	09 November 2023	ok	09 November 2023		No result	0.075	<0.005	<0.01	
ISOLDE	Isolde - Magnet	2*1L	04 December 2023	ok	04 December 2023		<0.2	0.010	0.061	1.9	**X**
	isolde - BLDG170	2*1L	04 December 2023	ok	04 December 2023		<0.2	0.011	0.028	2.07	**X**

Conclusion

- **Monitoring of the water quality in progress**
- **Several points (not related to sulfur) to investigate**
- **Additional analysis planned during technical stop**
- **New campaign planned during the YETS 24-25**





ENGINEERING
DEPARTMENT

home.cern