

ROC requirements

Compliance review

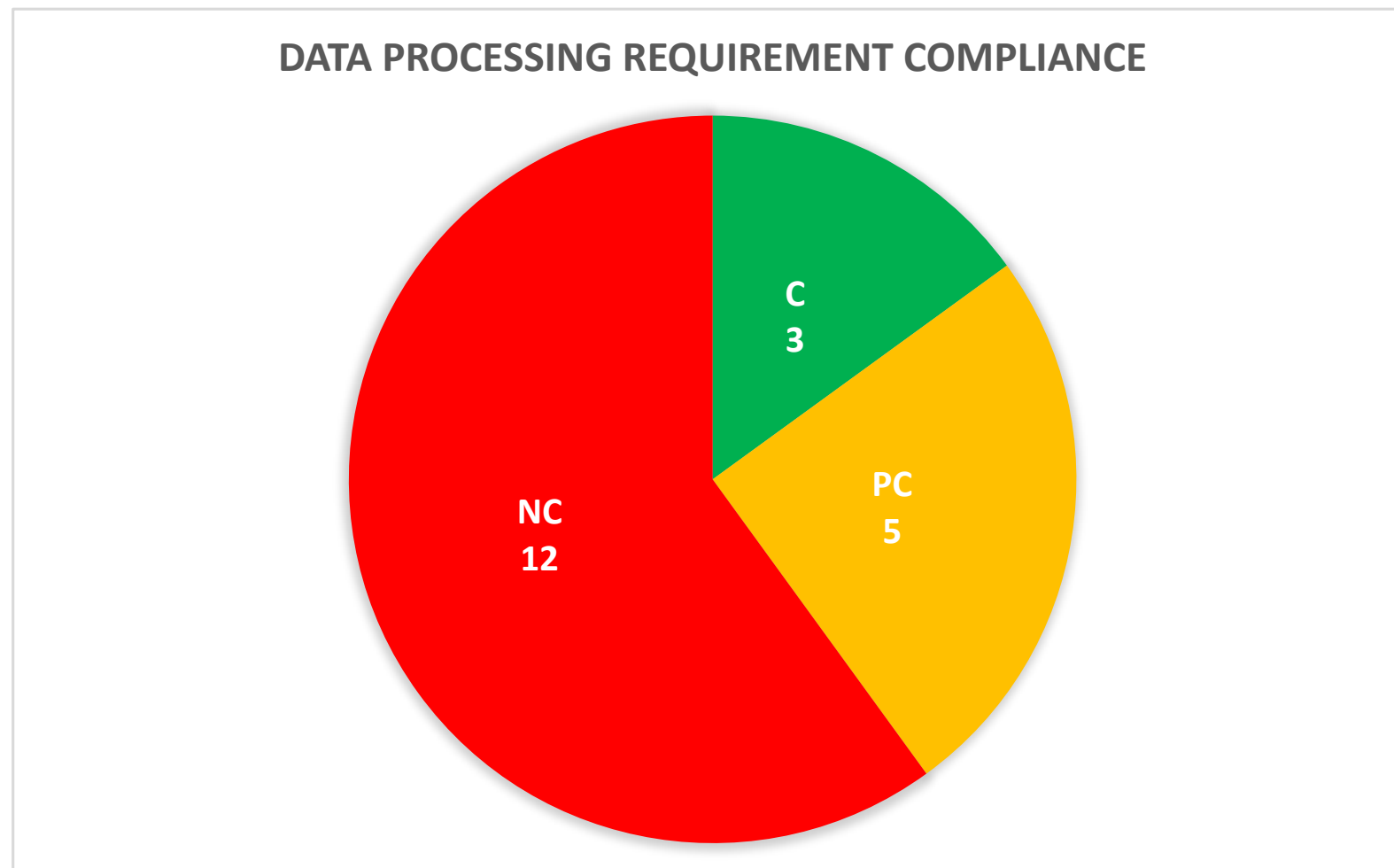


solar orbiter



Data Processing Capability Review

- In summary:
 - After validations, data processing requirement compliance is 15 %
 - No test coverage for 7 NC, No full implementation for 5 NC
 - 6 NC/PC need special attention



C = Compliant, PC = Partially Compliant, NC = Non Compliant

Data Retrieval Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0010	<p>The ROC shall be able of requesting and retrieving the following data from MOC:</p> <ul style="list-style-type: none"> - The RPW TM raw data - The RPW TC raw data - The RPW TM report - The RPW TC report <p>For a given APID and time ranges. The request shall be done using the mechanism defined in [RD4].</p>	REQ-ROC-SSS-0120	ROC-DATA_RETR-010-RPW

- **Implementation**

- Prime: Python EDDS client (https://git.ias.u-psud.fr/spice/edds_client)
- Backup: MOC EDDS Web client (see SOL-ESC-IF-05011,Is.1,Rev.2)
- SFTP server at LESIA (to drop EDDS response files)
- RODP pipeline to call Python client in automated way

- **Compliance status is PC because:**

- Prime/backup clients and SFTP server are up-and-running (tested with MOC)
- TM report and TC raw data retrieval not implemented in the Python client
- EDDS requests triggered manually by ROC operator during tests

Cause	Risk	Probability	Criticality	Solutions
TmReport not implemented in Python client	Cannot retrieve S/C HK from TmReport with Python client	Medium	High	Short term backup solution is to use MOC EDDS Web client
TcRaw not implemented in Python client	Cannot retrieve TcRaw data from Python client	Low	Low	TC raw data are retrieved via TcReport

Data Retrieval Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0020	The ROC shall be able of retrieving the operation input data files (i.e., E-FECS , TMC), as soon as their are made available by SOC. The data shall be retrieved via the mechanism defined in [RD7].	REQ-ROC-SSS-0140 REQ-ROC-SSS-0130 REQ-ROC-SSS-0150	ROC-DATA_RETR-020-OPS

- **Implementation**

- SOC-ROC GFTS local node at LESIA (files are dropped by SOC)
- RODP pipeline to automatically check and process new files

- **Compliance status is C because:**

- SOC-ROC GFTS local node up-and-running (tested with SOC during E2E-1)
- Input data processing triggered manually by ROC operator during tests

Cause	Risk	Probability	Criticality	Solutions

Data Retrieval Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0030	The ROC shall be able of retrieving the Solar Orbiter mission ancillary data (e.g., SPICE kernels, CDF-digest files), as soon as their are made available by SOC. The data shall be retrieved via the mechanism defined in [RD7].	REQ-ROC-SSS-0160	ROC-DATA_RETR-030-ANC

- **Implementation**

- SOC-ROC GFTS local node at LESIA (ancillary files are dropped by SOC)
- RODP pipeline to automatically check and process new files

- **Compliance status is **NC** because:**

- Not formally tested with SOC
- SOC-ROC GFTS local node up-and-running
- First set of SOC-provided ‘operational’ SPICE kernels delivered by SOC on Dec. 2019

Cause	Risk	Probability	Criticality	Solutions

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0040	The ROC shall produce the RPW LZ data defined in [RD18]. The LZ data files shall store the RPW TM packet data as delivered by the MOC.	REQ-ROC-SSS-0200	ROC-DATA_PROD-010-LZ

- **Implementation**
 - RODP pipeline to produce LZ XML files from input EDDS TmRaw and TcReport XML files
- **Compliance status is C because:**
 - Validated during RSS4VC using SVT1B RPW data
 - Not tested with all RPW telemetry/command packets

Cause	Risk	Probability	Criticality	Solutions

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0050	The ROC shall produce the RPW L0 science data defined in [RD18].	REQ-ROC-SSS-0210	ROC-DATA_PROD-020-L0

- **Implementation**
 - RODP pipeline to produce L0 HDF5 files from input EDDS TmRaw and TcReport XML files
- **Compliance status is C because:**
 - Validated during RSS4VC using SVT1B RPW data
 - Not tested with all RPW telemetry/command packets

Cause	Risk	Probability	Criticality	Solutions

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0060	The ROC shall produce the RPW L1 science data defined in [AD2].	REQ-ROC-SSS-0220 REQ-ROC-SSS-0190 REQ-ROC-SSS-0300 REQ-ROC-SSS-0290 REQ-ROC-SSS-0260 REQ-ROC-SSS-0170	ROC-DATA_PROD-030-L1 ROC-DATA_PROD-060-HK

- **Implementation**

- RODP pipeline to produce L1 CDF files from input L0 HDF5 files

- **Compliance status is PC because:**

- Tested during RSS4VC using SVT1B RPW data, but ...
- Missing L1 CDF products: Bias sweep/current data, SBM1/SBM2 mode data, HFR LIST mode data, new BP1/BP2 data
- SOOP_ID, OBS_ID and QUALITY_BITMASK values setting not implemented yet
- Epoch values not computed with SOC-provided SPICE kernels

Cause	Risk	Probability	Criticality	Solutions
Missing L1 CDF	All L1 data not produced correctly	Low (medium for HFR LIST mode)	High (medium for HFR LIST mode)	Except for HFR LIST, implementation is done, need to be tested/validated before launch
Epoch value computation with SPICE kernels	Epoch TT2000 time not computed correctly in L1 and L2	Low	High	Implementation is done, need to be tested before launch
No SOOP_ID and OBS_ID	Not fully compliant with the latest SoIO data standards [SOL-SGS-TN-0009-MetadataStandard-2.4]	High during commissioning	Low	Not applicable during commissioning, to be implemented before cruise phase
No QUALITY_BITMASK	QUALITY_FLAG in L1R/L2 not computed	High during commissioning	Medium	To be implemented before cruise phase

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0070	The ROC shall produce the RPW L2 science data defined in [AD2]. The L2 data will be generated using the software and calibration tables provided by the sub-system teams (BIAS, LFR, TDS, THR, SCM)	REQ-ROC-SSS-0270 REQ-ROC-SSS-0250 REQ-ROC-SSS-0240 REQ-ROC-SSS-0640 REQ-ROC-SSS-0430 REQ-ROC-SSS-0280	ROC-DATA_PROD-043-L2 ROC-DATA_PROD-040-L2 ROC-DATA_PROD-042-L2 ROC-DATA_PROD-044-L2 ROC-DATA_PROD-041-L2

- **Implementation**

- RODP pipeline to call RCS in order to produce L1R/L2 CDF files from input L1 CDF files

- **Compliance status is PC because:**

- Tested during RSS4VC, but ...
- L1R/L2 CDF production not tested (SBM1/SBM2 mode, LFR BP1/BP2, hist2D, TDS TSWF)
- QUALITY_FLAG values setting not implemented yet
- Vector/tensor in instrument reference frame only, not RTN data (no SPICE kernel used)
- Tested with ROC-SGSE data only (except for THR L2 CDF)
- No calibration table log file used

Cause	Risk	Probability	Criticality	Solutions
L1R/L2 CDF production not tested	Missing/wrong L1R/L2 CDF products	Medium	High	Test the production in priority before launch
No QUALITY_FLAG value	No data quality flag for L1R/L2 CDF	High for commissioning	Medium	Implements QUALITY_FLAG value setting in RCS before cruise phase (depends on QUALITY_BITMASK)
No RTN data	L2 data only provided in instrument frame	High	High	Do be implemented in priority in RCS

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0080	The ROC shall support the production of the RPW L3 science data defined in [AD2].	REQ-ROC-SSS-0321	ROC-DATA_PROD-050-L3

- **Implementation**
 - ROC to centralize L3 products at LESIA (delivered by external partners) and to distribute to ESAC
- **Compliance status is **NC** because:**
 - Implementation will start after launch

Cause	Risk	Probability	Criticality	Solutions

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0090	The ROC shall produce RPW HK parameter “digest” files, as defined in [RD18].	REQ-ROC-SSS-0230 REQ-ROC-SSS-0190 REQ-ROC-SSS-0170	ROC-DATA_PROD-060-HK ROC-DATA_PROD-030-L1

- **Implementation**
 - RODP pipeline to produce HK CDF daily files from input L0 HDF5 files
- **Compliance status is PC because:**
 - Validated during RSS4VC
 - ‘Raw’ values instead of ‘engineering’ (i.e., no transfer function applied)

Cause	Risk	Probability	Criticality	Solutions
Raw values in HK CDF	Wrong HK parameter interpretation	Low	Low	At short term it has been decided with RCS Teams to let HK as is.

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0100	The ROC shall produce the RPW data summary plots defined in [AD2].	REQ-ROC-SSS-0380	ROC-DATA_PROD-070-QL

- **Implementation**
 - RODP pipeline to produce quicklooks defined in [AD2]
- **Compliance status is **NC** because:**
 - Not implemented

Cause	Risk	Probability	Criticality	Solutions

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0110	<p>The ROC shall deliver to the SOC a data processing pipeline to produce the LL01 for RPW.</p> <p>The delivery mechanism and expected pipeline specification are defined in [RD23].</p> <p>The LL01 expected format and content is given in [RD24].</p> <p>The ROC shall support the maintenance and possible upgrades of the pipeline during the mission.</p>	<p>REQ-ROC-SSS-0540</p> <p>REQ-ROC-SSS-0530</p>	<p>ROC-DATA_PROD-080-LL01</p>

- **Implementation**

- RPW Low Latency Data Pipeline (LLDP) to produce LL01 CDF from EDDS TmRaw data XML files

- **Compliance status is PC because:**

- New version 00.03.02 delivered to SOC
- 3/4 tests passed (not expected behavior for "fully failed" test case)

Cause	Risk	Probability	Criticality	Solutions
Full failed' test not passed	RPW LLDP not run at SOC	Low	Medium	Fixing bug is in progress Backup instance of the LLDP deployed at LESIA

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0130	The ROC shall support the capability of fully/partially re-processing the RPW data stored at LESIA. Data that are already publicly available at ESAC Solar Orbiter archive shall be re-processed and re-delivered following the strategy defined in [AD2].	REQ-ROC-SSS-0370	ROC-DATA_PROD-090-REPROC

- **Implementation**
 - RODP pipeline to re-process RPW data products (LZ, L0, L1, L1R/L2 and HK)
- **Compliance status is **NC** because:**
 - Implemented but not tested
 - Re-processing triggered manually by ROC operator

Cause	Risk	Probability	Criticality	Solutions

Data Production Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0140	The ROC shall be able of converting the On-board Time (OBT) to Univeral Time Coordinated reference time.	REQ-ROC-SSS-0180	ROC-DATA_PROD-100-OBT.UTC

- **Implementation**
 - Use SOC-provided SPICE kernels as inputs to the RODP for UTC computation
- **Compliance status is **NC** because:**
 - Implemented but not tested
 - First SOC-provided 'operational' SPICE kernels received on Dec. 2019

Cause	Risk	Probability	Criticality	Solutions
SOC-provided SPICE kernels processing not tested	UTC time not computed correctly for RPW packets time-tagging and in RPW products	Low	High	Implementation is done, need to be tested before launch

Data Distribution Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0150	<p>The ROC shall make available its preliminary RPW data to the Solar Orbiter and RPW consortium teams. It includes:</p> <ul style="list-style-type: none"> - L1, L2, L3 data files - Quick-looks - HK “digest” files - RPW Low Latency prime and backup data produced at SOC and LESIA respectively <p>Data is labelled as “preliminary” as long as their are not publicly archived at ESAC.</p>	<p>REQ-ROC-SSS-0400 REQ-ROC-SSS-0700</p>	<p>ROC-DATA_DIST-010-PRE_DATA ROC-DATA_DIST-015-PRE_DATA ROC-DATA_DIST-020-ANC</p>

- **Implementation**

- RPW preliminary data files visible from the ROC Web site (private area)
- RODP pipeline to make a copy of the RPW preliminary data files in the ROC HTTPS server.

- **Compliance status is NC because:**

- Implemented but not fully tested
- ROC Web site up-and-running
- Copy triggered manually by ROC operator

Cause	Risk	Probability	Criticality	Solutions
Preliminary RPW data distribution not fully tested	Error when make data available	Low	High	Distribution must be tested before launch with test data

Data Distribution Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0160	The ROC shall make available to the RPW consortium teams the mission ancillary data provided by the SOC (SPICE kernels and CDF digest files containing the orbit, attitude, OBT-UTC time conversion, reference frame).	REQ-ROC-SSS-0400	ROC-DATA_DIST-010-PRE_DATA ROC-DATA_DIST-015-PRE_DATA ROC-DATA_DIST-020-ANC

- **Implementation**

- SOC-provided ancillary data files visible from the ROC Web site (private area)
- RODP pipeline to make a copy of the SOC-provided ancillary data files in the ROC HTTPS server.

- **Compliance status is NC because:**

- Implemented but not formally tested
- ROC Web site up-and-running
- Copy triggered manually by ROC operator

Cause	Risk	Probability	Criticality	Solutions
ancillary data distribution not fully tested	Error when make data available	Low	High	Distribution must be tested before launch with test data

Data Distribution Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0790	<p>During the cruise and nominal phases, the ROC shall support the capability of distributing RPW data files within 48h after the reception at LESIA.</p> <p>The survey data shall be provided as daily files and the SBM1/SBM2 data as single files per event.</p> <p>N.B. The first distributed data files may be incomplete since some TM packets can be available with some delay in the MOC DDS server. If missing TM packets are lately retrieved, new versions of the related files shall be generated and</p>	<p>REQ-ROC-SSS-0400</p> <p>REQ-ROC-SSS-0510</p> <p>REQ-ROC-SSS-0500</p>	<p>ROC-DATA_DIST-010-PRE_DATA</p> <p>ROC-DATA_DIST-015-PRE_DATA</p> <p>ROC-DATA_DIST-020-ANC</p>

- **Implementation**

- Implements REQ-ROC-CIRD-0040, REQ-ROC-CIRD-0050, REQ-ROC-CIRD-0060, REQ-ROC-CIRD-0070, REQ-ROC-CIRD-0080, REQ-ROC-CIRD-0090, REQ-ROC-CIRD-00100, REQ-ROC-CIRD-0130 , REQ-ROC-CIRD-0150

- **Compliance status is NC because:**

- Not tested

Cause	Risk	Probability	Criticality	Solutions

Data Storage Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0170	<p>The ROC shall host at the LESIA site, a RPW data file server storing all the RPW-related data produced before, during the mission and post-operations phases.</p> <p>It shall include at least:</p> <ul style="list-style-type: none"> - RPW TM, LZ, L0, L1, L2, L3 and HK-digest data - RPW data summary plots - RPW LL01, LL02 and LL03 data, produced at SOC - Mission ancillary data (SPICE kernels and CDF-digest) - Submitted RPW operation files (IOR, MDOR/PDOR, 	REQ-ROC-SSS-0390	ROC-DATA_ARCH-010-LESIA

- **Implementation**

- RPW data file prime server at LESIA for data production and distribution (HTTPS)
- RPW data file backup server at LESIA for long-term storage

- **Compliance status is NC because:**

- Implemented but not formally tested
- Prime server up-and-running
- Backup server planned to be ready for beginning of cruise phase

Cause	Risk	Probability	Criticality	Solutions

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0180	<p>The ROC shall be able to deliver to ESAC data archive the RPW data within 3 months.</p> <p>The delivery mechanism shall comply the specification defined in [RD14].</p> <p>It concerns the following data:</p> <ul style="list-style-type: none"> - L1 data - L2 data - L3 and summary plots data - Calibration tables 	REQ-ROC-SSS-0410	ROC-DATA_ARCH-020-ESAC

- **Implementation**
 - SOC-ROC GFTS local node at LESIA
 - RODP pipeline to automatically drop files to archive
- **Compliance status is NC because:**
 - Not formally validated with SOC
 - SOC-ROC GFTS local node up-and-running
 - Automated process not implemented

Cause	Risk	Probability	Criticality	Solutions
No test of RPW data delivery to ESAC	Error when delivering data	Medium	High	Planned test with SOC

Data Archive Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0190	<p>The ROC shall be able to deliver to CDPP data archive the RPW data within TBD months. The delivery mechanism shall comply the specification defined in [RD?]. It concerns the following data:</p> <ul style="list-style-type: none"> - L1 data - L2 data - L3 and summary plots data - Calibration tables (TBC) 	REQ-ROC-SSS-0420	ROC-DATA_ARCH-030-CDPP

- **Implementation**
 - Interface specification to be defined with CDPP
- **Compliance status is NC because:**
 - Implementation to be discussed with CDPP after launch

Cause	Risk	Probability	Criticality	Solutions

Data visualization Capability Review

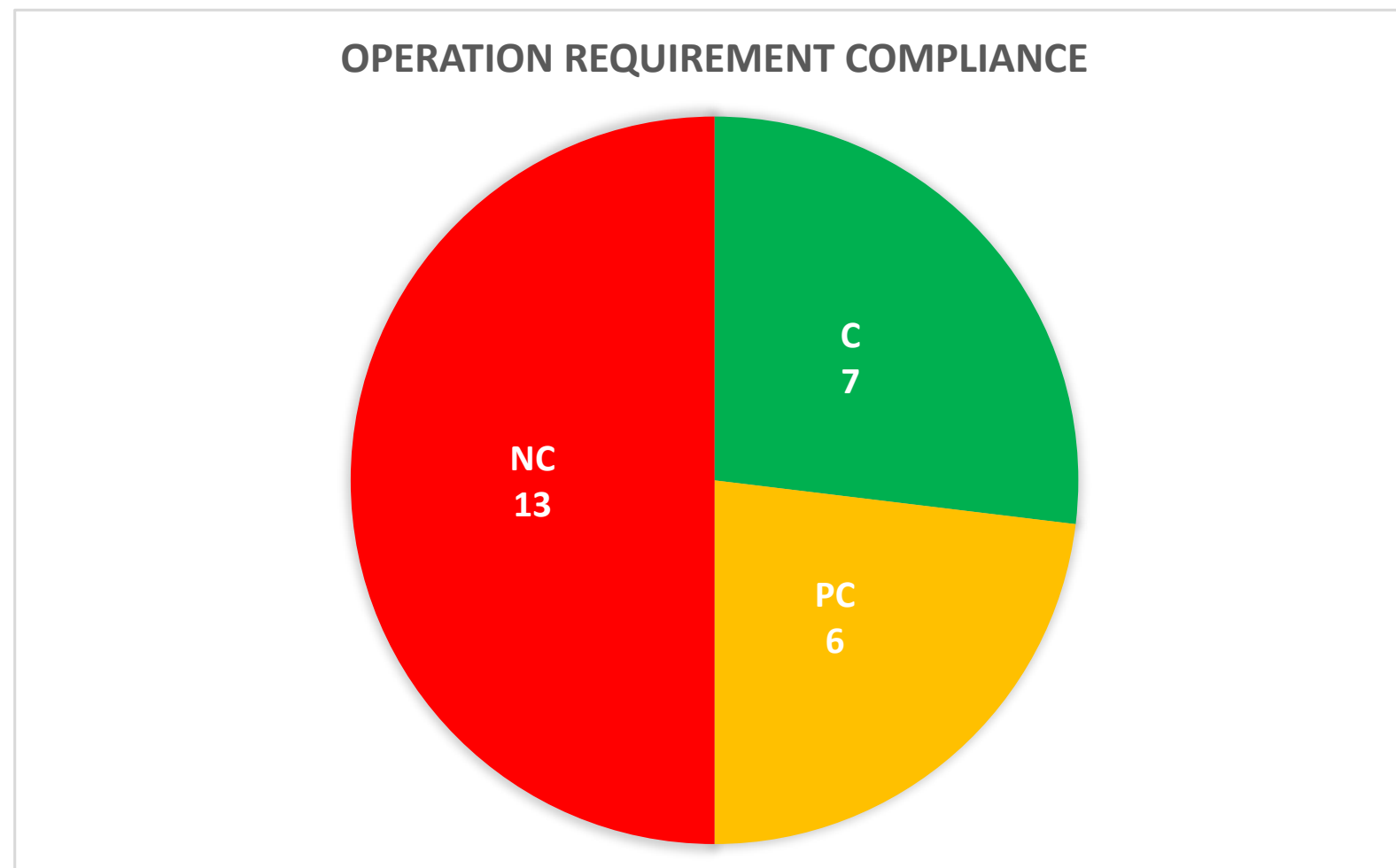
ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0200	The ROC shall be able of visualizing data defined in [AD?] It includes: - RPW science data - RPW time synchronizations between DPU and analyzers and DPU and spacecraft on-board time (OBT) - RPW HK and event reporting data - RPW TM/TC downlinking/uplinking flows and status - Instrument status - Statistictics related to TM/TC counters, errors	REQ-ROC-URD-0260 REQ-ROC-URD-0150 REQ-ROC-URD-0140 REQ-ROC-URD-0220 REQ-ROC-URD-0080 REQ-ROC-URD-0180 REQ-ROC-URD-0280 REQ-ROC-URD-0240 REQ-ROC-URD-0230	ROC-RPW_MONIT-010-RPW_DATA ROC-DATA_VISU-010-VISU

- **Implementation**
 - ROC MUSIC TV tool for RPW quick data visualization
 - RODP pipeline to generate and make available summary reports
- **Compliance status is NC because:**
 - MUSIC TV tool not fully implemented
 - RPW summary reports implemented but not formally tested

Cause	Risk	Probability	Criticality	Solutions
MUSIC TV tool not fully implemented				
RPW summary reports not tested				

Operation Capability Review

- In summary:
 - After validations, operation requirement compliance is 27%
 - No test coverage for 12 NC, No full implementation for 5 NC
 - 6 NC/PC need special attention



C = Compliant, PC = Partially Compliant, NC = Non Compliant

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0220	The ROC shall support the generation of RPW IOR files for MTP planning cycles. The IOR files shall be saved in the format defined in [RD5].	REQ-ROC-URD-0570 REQ-ROC-URD-0460	ROC-RPW_COM-050-STP_PROD ROC-RPW_COM-010-MTP_PROD ROC-RPW_COM-090-MDOR_PROD ROC-RPW_COM-080-PDOR_PROD

- **Implementation**

- ROC MUSIC FAUST tool for producing RPW operations timeline and export it as MTP IOR files

- **Compliance status is NC because:**

- Not formally validated with SOC
- ROC MUSIC FAUST tool up-and-running but improvements requested

Cause	Risk	Probability	Criticality	Solutions
MTP IOR file generation not validated with SOC	Badly formatted MTP IOR	Medium	High	To be tested with SOC

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0230	The ROC shall support the submission to the SOC of RPW IOR files for MTP planning cycles. The IOR files shall be submitted using the mechanism defined in [RD7]	REQ-ROC-URD-0732	ROC-RPW_COM-060-STP_DELIV ROC-RPW_COM-020-MTP_DELIV

- **Implementation**
 - SOC-ROC GFTS local node at LESIA for MTP IOR files delivery
- **Compliance status is **NC** because:**
 - Not formally validated with SOC
 - SOC-ROC GFTS local node up-and-running

Cause	Risk	Probability	Criticality	Solutions
MTP IOR file delivery not validated with SOC	Error when delivering MTP IOR	Medium	High	To be tested with SOC

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0240	The ROC shall ensure that the operations timeline within the RPW MTP IOR files delivered to SOC, are consistent with the instrument resource allocations (TM corridors and power consumption).	REQ-ROC-URD-0700 REQ-ROC-URD-0660	ROC-RPW_COM-030-MTP_CONST

- **Implementation**
 - TMChecker to verify the IOR consistency w.r.t. TM bit rate allocation
- **Compliance status is **NC** because:**
 - TMChecker implemented but not formally tested
 -

Cause	Risk	Probability	Criticality	Solutions
TMChecker not tested	Wrong computation of telemetry bit rate for RPW from MTP IOR	Medium	Medium	Formally test TMChecker

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0250	<p>The ROC shall support the capability of compute the RPW resources, instantaneous and daily average TM bit rate as well as power consumption, over a given MTP cycle. Especially, both predictive and real TM bit rates calculation shall be supported, in order to:</p> <ul style="list-style-type: none"> - Ensure a priori that the expected bit rate is inside the MTP Telemetry corridors (TMC) [RD26], delivered by SOC for planning the operations. - Verify a posteriori the real bit rate using the downlinked data 	REQ-ROC-URD-0680 REQ-ROC-URD-0650 REQ-ROC-URD-0640 REQ-ROC-URD-0620 REQ-ROC-URD-0670 REQ-ROC-URD-0690 REQ-ROC-URD-0630	ROC-RPW_COM-040-RESOU

- **Implementation**
 - TMCcalculator for the predictive TM bit rate calculation
 - TRAC tool for actual TM bit rate calculation
- **Compliance status is NC because:**
 - Not tested

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0260	The ROC shall support the generation of RPW IOR files for STP planning cycles. The IOR files shall be saved in the format defined in [RD5].	REQ-ROC-URD-0570 REQ-ROC-URD-0460	ROC-RPW_COM-050-STP_PROD ROC-RPW_COM-010-MTP_PROD ROC-RPW_COM-090-MDOR_PROD ROC-RPW_COM-080-PDOR_PROD

- **Implementation**
 - ROC MUSIC FAUST tool for producing RPW operations timeline and export it as STP IOR files
- **Compliance status is C because:**
 - Passed during E2E-1 tests
 - ROC MUSIC FAUST tool up-and-running but improvements requested
 -

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0270	The ROC shall support the submission to the SOC of RPW IOR files for STP planning cycles. The IOR files shall be submitted using the mechanism defined [RD7].	REQ-ROC-URD-0732	ROC-RPW_COM-060-STP_DELIV ROC-RPW_COM-020-MTP_DELIV

- **Implementation**
 - SOC-ROC GFTS local node at LESIA for STP IOR files delivery
- **Compliance status is C because:**
 - Passed during E2E-1 tests
 - SOC-ROC GFTS local node up-and-running

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0280	The ROC shall support the capability of requesting to SOC, the SBM1/SMB2 events data to be downlinked from the on-board SSMM. The request shall be performed using the mechanism defined [RD?] and in the format defined in [RD?].	REQ-ROC-URD-0735	ROC-RPW_COM-070-SBM_EVENT

- **Implementation**
 - Implementation planned during cruise phase (not interface with SOC specified)
- **Compliance status is NC because:**
 - Not implemented

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0290	The ROC shall support the generation of RPW PDOR files. The PDOR files shall be saved in the format defined in [RD21].	REQ-ROC-URD-0460 REQ-ROC-URD-0590	ROC-RPW_COM-050-STP_PROD ROC-RPW_COM-090-MDOR_PROD ROC-RPW_COM-080-PDOR_PROD ROC-RPW_COM-010-MTP_PROD

- **Implementation**
 - ROC MUSIC FAUST tool for producing RPW operations timeline and export it as PDOR files
- **Compliance status is C because:**
 - Passed during SVT-1 tests
 - ROC MUSIC FAUST tool up-and-running but improvements requested
 -

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0291	The ROC shall support the submission to the MOC of RPW PDOR files. The PDOR files shall be submitted using the mechanism defined [RD?].	REQ-ROC-URD-0733	ROC-RPW_COM-081-PDOR_DELIV

- **Implementation**
 - MOC-ROC GFTS local node at LESIA for PDOR files delivery
- **Compliance status is C because:**
 - MOC-ROC GFTS local node up-and-running

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0300	For direct operations related to the on-board memory (patching), the ROC shall support the generation of MDOR. The MDOR files shall be saved in the format defined in [RD21].	REQ-ROC-URD-0460 REQ-ROC-URD-0610	ROC-RPW_COM-050-STP_PROD ROC-RPW_COM-090-MDOR_PROD ROC-RPW_COM-080-PDOR_PROD ROC-RPW_COM-010-MTP_PROD

- **Implementation**
 - ROC MDORgen tool for converting MEB GSE TcScript timeline into MDOR files
- **Compliance status is C because:**
 - Passed during SVT-1 tests
 - ROC MDORgen tool up-and-running but improvements needed
 - MDOR produced from MEB GSE TcScript (MIB compatibility?)

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0301	For direct operations related to the on-board memory (patching), the ROC shall support the submission to the MOC of MDOR. The MDOR files shall be submitted using the mechanism defined [RD?].	REQ-ROC-URD-0734	ROC-RPW_COM-091-MDOR_DELIV

- **Implementation**
 - MOC-ROC GFTS local node at LESIA for MDOR files delivery
- **Compliance status is C because:**
 - Interface test passed but not
 - MOC-ROC GFTS local node up-and-running

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0370	The ROC shall be capable of verifying that a flight software update has been correctly applied.	REQ-ROC-URD-0770	ROC-RPW_MONIT-040-SW_PATCH

- **Implementation**
 - TC execution verification by ROC (REQ-ROC-CIRD-0350)
 - TM data verification by RPW teams
- **Compliance status is **PC** because:**
 - Software update performed during SVT1, but ...
 - No formal validation of the verification process in near real conditions

Cause	Risk	Probability	Criticality	Solutions

Monitoring Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0640	The ROC shall ensure flight software patching (service 6) operations.	REQ-ROC-URD-0760 REQ-ROC-URD-0610	ROC-RPW_MONIT-010-RPW_DATA ROC-RPW_COM-090-MDOR_PROD

- **Implementation**
 - Implements REQ-ROC-CIRD-0300, REQ-ROC-CIRD-0301 and REQ-ROC-CIRD-0370
- **Compliance status is PC because:**
 - Passed with limitations (see previous slide)

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0310	The ROC shall support the generation of TC sequences for RPW. The sequences shall be saved in the format defined in [RD22].	REQ-ROC-URD-0310 REQ-ROC-URD-0370 REQ-ROC-URD-0320	ROC-RPW_COM-100-SEQ_PROD

- **Implementation**
 - ROC MUSIC FIGARO tool for producing RPW TC sequences and export them as MOC requested format files
- **Compliance status is C because:**
 - Passed during SVT-1 tests
 - ROC MUSIC FIGARO tool up-and-running but improvements required
 -

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0311	The ROC shall support the submission to the MOC of TC sequences for RPW. The sequences shall be delivered using convention defined in [RD15].	REQ-ROC-URD-0731	ROC-RPW_COM-110-SEQ_TEST ROC-RPW_COM-101-SEQ_DELIV

- **Implementation**
 - MOC-ROC GFTS local node at LESIA for TC sequence files delivery
- **Compliance status is C because:**
 - Interface test passed
 - MOC-ROC GFTS local node up-and-running

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0330	The ROC shall only use the operational version of the MIB to submit its operation requests (IOR, MDOR, PDOR) during the Solar Orbiter mission.	REQ-ROC-SSS-0750 REQ-ROC-URD-0330	ROC-RPW_COM-120-SEQ_SOUR

- **Implementation**
 - Import the operational MIB into the ROC mission database (MDB)
 - Use the operational MIB to generate IOR, MDOR, PDOR
- **Compliance status is NC because:**
 - Implemented but not tested
 -

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0360	The ROC shall be capable of verifying that the instrument is in the expected state after TC executions on-board.	REQ-ROC-SSS-0310 REQ-ROC-URD-0750 REQ-ROC-URD-0740	ROC-RPW_MONIT-010-RPW_DATA ROC-RPW_MONIT-030-ISM ROC-DATA_PROD-065-REPORT ROC-RPW_MONIT-020-TM_S1

- **Implementation**
 - MUSIC Parameters Viewer App tool to check RPW state against uplinked commands
- **Compliance status is NC because:**
 - Implemented but not tested

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0350	The ROC shall be capable of verifying the acceptance and execution completion of a RPW TC uplinked on-board. The verification shall be realized using the Service 1 telemetry.	REQ-ROC-SSS-0310 REQ-ROC-URD-0740	ROC-RPW_MONIT-010-RPW_DATA ROC-RPW_MONIT-030-ISM ROC-DATA_PROD-065-REPORT ROC-RPW_MONIT-020-TM_S1

- **Implementation**
 - Implements REQ-ROC-CIRD-0010 (TcReport) and REQ-ROC-CIRD-0200 (MUSIC TV)
- **Compliance status is NC because:**
 - Not fully implemented and tested

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0590	The ROC shall made available to the BIAS team all downlinked telemetry data required to control and refine the BIAS current values applied on-board.	REQ-ROC-SSS-0300 REQ-ROC-SSS-0290	ROC-DATA_PROD-030-L1

- **Implementation**
 - Implements REQ-ROC-CIRD-0060 (BIAS L1 CDF)
- **Compliance status is **NC** because:**
 - Not fully implemented and tested

Cause	Risk	Probability	Criticality	Solutions

Command/control Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0620	<p>The ROC shall supervise the process of the SBM1/SBM2 event data selection at RPW level.</p> <p>The supervision shall consist of:</p> <ul style="list-style-type: none"> - Providing the data and facilities to support the selection process - Ensuring the SBM selection operation requests to SOC - Producing history log of SBM selected and retrieved 	<p>REQ-ROC-URD-0730</p> <p>REQ-ROC-URD-0720</p> <p>REQ-ROC-URD-0710</p> <p>REQ-ROC-URD-0780</p>	<p>ROC-RPW_MONIT-010-RPW_DATA</p>

- **Implementation**
 - MUSIC SISSI tool to view and select SBM1/SBM2 event data to downlink
- **Compliance status is NC because:**
 - Not implemented (no ICD with SOC, planned after launch)

Cause	Risk	Probability	Criticality	Solutions

Monitoring Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0340	The ROC shall be able of: <ul style="list-style-type: none"> - Monitoring the status of the instrument - Monitoring some HK parameters at spacecraft level (solar array and HGA position, temperature probes, etc.) - Triggering alerts in cas of anomalies - Automatically publish summary reports about the instrument status every 24 hours - Generate tendency report on demand, in order to follow the instrument behaviour over the mission (i.e., internal 	REQ-ROC-URD-0290 REQ-ROC-URD-0260 REQ-ROC-URD-0780 REQ-ROC-URD-0280 REQ-ROC-URD-0220 REQ-ROC-SSS-0310 REQ-ROC-URD-0270 REQ-ROC-URD-0210 REQ-ROC-URD-0750	ROC-DATA_VISU-010-VISU ROC-RPW_MONIT-010-RPW_DATA ROC-RPW_MONIT-030-ISM ROC-DATA_PROD-065-REPORT ROC-RPW_MONIT-020-TM_S1

- **Implementation**

- implements REQ-ROC-CIRD-0200, REQ-ROC-CIRD-0340, REQ-ROC-CIRD-0350, REQ-ROC-CIRD-0360, REQ-ROC-CIRD-0820

- **Compliance status is NC because:**

- Not fully implemented and tested

Cause	Risk	Probability	Criticality	Solutions

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0420	<p>The ROC shall be capable of monitoring the good health of its software infrastructure and related processes, more particularly:</p> <ul style="list-style-type: none"> - The processing, data and user interface servers works - The data processing pipelines are up-and-running - The operation tools is available - The external interfaces are reachable (DDS and GFTS) <p>Results of the monitoring shall be at least reported into log files, readable by the ROC administrator and operator.</p>	REQ-ROC-URD-0060 REQ-ROC-SSS-0030 REQ-ROC-SSS-0010 REQ-ROC-SSS-0100 REQ-ROC-URD-0790 REQ-ROC-SSS-0110	ROC-ROC_MONIT-010-RSS

- **Implementation**
 - Software log files
 - Web GUI for tool administration (Django for MUSIC, Gitlab for pipelines)
- **Compliance status is NC because:**
 - Not tested
 - Log files implemented
 - Web GUI partially implemented (Django OK, Gitlab NOK for prod.)
 - DDS and GFTS monitoring cannot fully supported by ROC

Cause	Risk	Probability	Criticality	Solutions

Monitoring Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0500	Outside of the working days and hours, any identified anomaly shall be saved automatically and notified to the ROC operator when she/he is present at ROC.	REQ-ROC-URD-0800 REQ-ROC-URD-0740 REQ-ROC-SSS-0010 REQ-ROC-URD-0760 REQ-ROC-SSS-0030 REQ-ROC-SSS-0100 REQ-ROC-URD-0790 REQ-ROC-SSS-0110	ROC-DATA_PROD-065-REPORT ROC-RPW_MONIT-020-TM_S1 ROC-RPW_MONIT-030-ISM ROC-ROC_MONIT-010-RSS ROC-RPW_MONIT-010-RPW_DATA

- **Implementation**

- Implements REQ-ROC-CIRD-0420, REQ-ROC-CIRD-0340, REQ-ROC-CIRD-0350, REQ-ROC-CIRD-0360, REQ-ROC-CIRD-0820

- **Compliance status is NC because:**

- Not fully implemented and tested
- Fully automated monitoring should be progressively implemented

Cause	Risk	Probability	Criticality	Solutions

Monitoring Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0820	During the cruise and nominal phases, the ROC shall support the capability of reporting every 24 hours about the in-flight instrument operations status and health, to the RPW Consortium.	REQ-ROC-URD-0760 REQ-ROC-URD-0750 REQ-ROC-URD-0740 REQ-ROC-SSS-0510	ROC-RPW_MONIT-010-RPW_DATA ROC-RPW_MONIT-030-ISM ROC-DATA_PROD-065-REPORT ROC-RPW_MONIT-020-TM_S1

- **Implementation**
 - Implements REQ-ROC-CIRD-0340, REQ-ROC-CIRD-0350 and REQ-ROC-CIRD-0360
- **Compliance status is **NC** because:**
 - Not fully implemented and tested

Cause	Risk	Probability	Criticality	Solutions

Ground support Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0400	The ROC shall support the capability of retrieving, producing and distributing to the RPW consortium, the RPW data and E-GSE stimuli generated on-ground during the mission (mainly for anomaly investigations and testing purposes.)	REQ-ROC-SSS-0550 REQ-ROC-SSS-0580 REQ-ROC-SSS-0590 REQ-ROC-SSS-0560 REQ-ROC-SSS-0610 REQ-ROC-SSS-0570	ROC-GRD_SUP-010-DATA_VISU ROC-GRD_SUP-020-DATA_DIST ROC-GRD_SUP-030-RPW_ANOMALY

- **Implementation**
 - ROC-SGSE pipeline to retrieve and process MEB GSE test log
 - ROC Web site to distribute ROC-SGSE products
- **Compliance status is PC because:**
 - Implemented but not tested

Cause	Risk	Probability	Criticality	Solutions

Ground support Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0410	The ROC shall support the capability of simulating the RPW DPU SBM1/SBM2 detection algorithms behaviour.	REQ-ROC-URD-0880 REQ-ROC-URD-0870	ROC-GRD_SUP-040-SBM_SIMU

- **Implementation**
 - SimuSBM1 and SimuSBM2 tool
- **Compliance status is **NC** because:**
 - Not tested
 - Implemented and used during DAS SBM1/SBM2 validation campaign on-ground
 - Need upgrades to be useable with real RPW data generated in-flight

Cause	Risk	Probability	Criticality	Solutions

Ground Support Capability Review

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0320	The ROC shall be capable of testing the execution of RPW TC sequences on GSE at LESIA. This functionality will have to be kept up-and-running during the mission.	REQ-ROC-URD-0371	ROC-RPW_COM-110-SEQ_TEST

- **Implementation**
 - ROC MUSIC FAUST tool for exporting RPW TC sequences timeline as MEB GSE TcScripts
- **Compliance status is C because:**
 - Test passed during RSS4VC

Cause	Risk	Probability	Criticality	Solutions

Uncovered EID-A requirements

ID	Text	Applicability	Comment
EIDA R-356	The PI shall ensure that the Level 1b and the level 2 processing SW comply with the requirements specified in [NR-15], "Software"	No	[NR-15] not defined
EIDA R-370	The PI shall comply with the in-flight thermal control requirements, specified in the Solar Orbiter Operation Requirements Document [NR-27] section 2.3.7.	No	Not a applicable to the ROC
EIDA R-376	The PI shall maintain the instrument on-board software throughout the mission.	No	See SOLO-RPWSW-MP-1703-CNES
EIDA R-381	The PI shall support the preparation of the Solar Orbiter Mission Planning, including exchange of files between the SSOC and SMOC in line with the requirements set out in the SGS-OGS ICD [NR-TBD]."	No	[NR-] not defined
EIDA R-391	The PI shall make available the necessary resources to support the procedure definition, the procedure approval, the test executions, the results analysis and the anomaly investigation/resolution for the first instrument switch-on Simulation campaign.		
EIDA R-393	The PI shall review and approve the FOP for the aspects/sections relevant to instrument operations.		

- Interface with CNES during commissioning not covered and tested
- Additional user needs raised from discussions with RPW Teams (Excel export, MEB GSE test log import)

Uncovered CIRD requirements

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0120	The ROC shall support the RPW data validation process defined in the RPW Data Verification and Validation Plan (DVVP).	REQ-ROC-SSS-0350 REQ-ROC-SSS-0330 REQ-ROC-SSS-0340 REQ-ROC-SSS-0360	
REQ-ROC-CIRD-0210	The ROC shall maintain a up-and-running Web page to view the availability status of the RPW science data products. The interface will have to be public and accessible from the RPW Web portal at LESIA.	REQ-ROC-URD-0800	
REQ-ROC-CIRD-0430	The ROC shall be support the RPW PI to maintain the RPW Website at LESIA by: <ul style="list-style-type: none"> - Providing information about RPW data generated at LESIA - Providing information about software to read and view the RPW data - Providing information related to the ROC and its activity 		
REQ-ROC-CIRD-0440	The RPW ground segment project manager shall be responsible of the RPW user manual updates during the exploitation phase of the mission (CP, NMP, EMP).		
REQ-ROC-CIRD-0450	The RPW ground segment project manager shall be the single point of contact for instrument planning activities and for data deliveries to the Solar Orbiter Archive		
REQ-ROC-CIRD-0460	The RPW ground segment project manager, or her/his representative, shall submit change requests to the MOC for approval, in case of deviations from foreseen procedures and activities		
REQ-ROC-CIRD-0470	The ROB shall have an access to the ROC tools allowing to: <ul style="list-style-type: none"> - Prepare the operation planning for RPW - Select SBM1/SBM2 event data to downlink - Discuss on the strategy to adopt in case of anomaly on-board 	REQ-ROC-SSS-0040 REQ-ROC-SSS-0050 REQ-ROC-URD-0020 REQ-ROC-URD-0010	
REQ-ROC-CIRD-0480	The RPW consortium (i.e, PI, Lead Cols, Cols and instrument teams) and Solar Orbiter MOC, SOC and PIs shall have a full access to retrieve RPW data files stored by the ROC at LESIA. External guests can also ask for an access, but it shall be formally accepted by the RPW PI.		

Uncovered CIRRD requirements

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0490	The manual procedures related to the routine operations shall be performed by ROC operators during working days and hours only. Outside of these periods, procedures taht can be automated shall be launched autonomously.	REQ-ROC-SSS-0500 REQ-ROC-SSS-0510	
REQ-ROC-CIRD-0510	The ROC shall participate to the preparation of the science operations at mission level. Especially, the RPW ground segment project manager, or her/his representative, shall be a member of the Solar Orbiter Science Operations Working Group (SOWG).		
REQ-ROC-CIRD-0520	The ROC shall provide all the inputs required by the ROB and RPW consortium, in order to prepare and follow the status of the instrument observing plan at each cycle levels (i.e., MLP, LTP, MTP and STP). The inputs are defined in [AD2].		
REQ-ROC-CIRD-0530	The ROC shall prepare the RPW operations planning, following the ROB instructions. Especially, the RPW ground segment project manager shall be a member of the ROB. The ROC shall ensure that the RPW operations planning is consistent with the mission timeline defined by the Solar Orbiter Science Working Team (SWT), SOWG and In-Situ Working Group (ISWG), including: - Science objectives defined in the Science Activity Plan (SAP) - Solar Orbier Observing Plans (SOOP) allocation - Resources allocation (TMC, power) - Coordinated operations (e.g., in situ burst survey mode synchronisation)		
REQ-ROC-CIRD-0540	The ROC shall perform at least once a week a TNR-HFR calibration on-board.		
REQ-ROC-CIRD-0550	The ROC shall perform at least once a week a LFR/SCM calibration on-board.		
REQ-ROC-CIRD-0560	The ROC shall perform at least once a week a BIAS calibration, in the science operations timeline.		

Uncovered CIRD requirements

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0570	The ROC shall support the capability of setting at least every week the BIAS currents applied on-board, from the inputs provided by the Bias Lead Col team and in accordance with the operation plans defined by the RPW consortium and ROB.		
REQ-ROC-CIRD-0580	The ROC shall perform at least once a week a BIAS sweeping, in the science operations timeline.		
REQ-ROC-CIRD-0600	The ROC shall provide a dedicated interface that allows the Bias team to request the Bias current values to be applied on the threere antennas on-board. As soon as the Bias team has submitted new current values, it shall take not longer than a week to be added in the RPW science operations timeline.		
REQ-ROC-CIRD-0610	The ROC shall be able of dumping at least 4 times a day the TDS triggered snapshots stored on-board.		
REQ-ROC-CIRD-0630	The ROC shall be the main interface between SOC, payload PIs, ROB and RPW consortium in case of discussions concerning the RPW selective downlink.		
REQ-ROC-CIRD-0650	The ROC shall supervise the contingency recovery operations at the RPW Consortium level. (The contingency recovery operations are leaded by the MOC at mission level.)		
REQ-ROC-CIRD-0660	The ROC shall coordinate the anomaly investigation and resolution related to RPW. Especially, it shall be the main point of contact between Solar Orbiter teams (MOC, SOC, PIs) and the RPW consortium.		
REQ-ROC-CIRD-0670	During RPW commissioning, the ROC shall support the CNES for the in-flight validation of the instrument. Especially it shall: - Support the CNES in the preparation of the commissioning operations. - Ensure the availability of the facilities required to perform the instrument commissioning and its validation - Be the main interface with the MOC to retrieve RPW TM data and submit TC. - Participate to the writing of the RPW commissioning-related report and review	REQ-ROC-SSS-0320	

Uncovered CIRD requirements

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0680	The ROC shall maintain up-and-running its GSE during the RPW AIT-AIV campaigns and in-flight instrument commissioning. Moreover, the ROC GSE will have to be available during the exploitation of RPW (mainly for anomaly investigation and TC execution testing).		
REQ-ROC-CIRD-0690	After launch the ROC lifetime shall be at least 12 years. Approx. 10 years of operations plus 2 years of post-operations.		
REQ-ROC-CIRD-0700	The ROC shall implement an auto-verification testing system in order to verify that its infrastructure is operational and performs as expected the functionalities described in the CIRD. In operation, this system will have to be run at least every 24 hours at LESIA and generate report log files.	REQ-ROC-SSS-0020	
REQ-ROC-CIRD-0710	The ROC shall support the validation of its infrastructure during the dedicated campaigns at LESIA or ESOC (for commissioning). It includes: <ul style="list-style-type: none"> - The tools required to perform the validation - The writing of the validation plan and the report documentation at RPW level - The organization of the validation campaign at LESIA (including TRR/TRB meetings) - The participation to the validation campaigns. 		
REQ-ROC-CIRD-0720	The ROC shall support the test campaigns planned by SOC to validate its interface with the IT. It concerns more specifically: <ul style="list-style-type: none"> - Interface compatibility tests - Interface integration tests - Interface validation tests As described in [RD25]		

Uncovered CIRD requirements

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0730	The ROC shall support the test campaigns planned by MOC to validate its interfaces with the IT (i.e. DDS and GFTS). It concerns more specifically: - Interface compatibility tests - Interface integration tests - Interface validation tests As described in [RD?]		
REQ-ROC-CIRD-0740	The ROC shall support the preparation, execution and results analyzing of the IGBT and SVT campaigns performed by MOC.		
REQ-ROC-CIRD-0750	The ROC shall support the preparation, execution and results analyzing of the SOV campaigns performed by MOC. The SOV includes more particularly the end-to-end tests to validate the whole loop operational process between IT, SOC and MOC.		
REQ-ROC-CIRD-0760	The ROC shall support the preparation, execution and results analyzing of operation rehearsals including RPW. It include at least: - Possible commissioning phase rehearsal coordinated by MOC before the launch - Remote-sensing checkout window rehearsal coordinated by SOC prior to the NMP		
REQ-ROC-CIRD-0770	The ROC shall deliver to MOC and SOC, RPW an instrument state model (i.e., state transitions versus command sequences). The ROC will be in charge of keeping up-to-date the instrument state model during all the phases of the project.		
REQ-ROC-CIRD-0780	The ROC shall be capable of processing a day of RPW telemetry raw data volume (~60 MegaBytes) in less than 120 seconds. This duration does not include the time required to query and retrieve the data from the MOC.	REQ-ROC-SSS-0480 REQ-ROC-SSS-0490	
REQ-ROC-CIRD-0800	During the cruise and nominal phases, the ROC shall be capable of visualizing the RPW data retrieved by MOC since the last spacecraft pass in less than 10 minutes. This duration does not include the possible latency due to the MOC DDS server response.		

Uncovered CIRD requirements

ID	Text	Covered by RSSS	Covered by SVS
REQ-ROC-CIRD-0810	During the RPW commissioning operations, the ROC shall be capable of visualizing the RPW data retrieved by MOC since the last spacecraft pass in less than TBD minutes. This duration does not include the possible latency due to the MOC DDS server response.		
REQ-ROC-CIRD-0830	During the commissioning, the ROC shall support the capability of reporting every TBD hours about the in-flight instrument operations status and health, to the RPW Consortium.		
REQ-ROC-CIRD-0840	As soon as the ROC has identified an anomaly, it shall be capable of informing the MOC, SOC and RPW Consortium within 24 hours.		
REQ-ROC-CIRD-0850	The ROC shall be fully operational at launch. Especially, the ROC system will have to be up-and-running and perform automated tasks 24 hours a day and 7 days a week. At least one ROC operator and one administrator will have to be present at the LESIA site during the working days and hours, in order to monitor activity and perform manual tasks.		
REQ-ROC-CIRD-0860	During the science phase, the ROC shall not be unavailable for more than 3 consecutive days.		
REQ-ROC-CIRD-0870	Except the RPW public page and ROC public server, the ROC system and interfaces shall be behind the LESIA firewall and thus only accessible from the LESIA Intranet only. Moreover: - ROC users shall be registered in the ROC database before using ROC operation tools. - ROC production servers shall only be accessible to the ROC administrators.	REQ-ROC-URD-0020 REQ-ROC-URD-0030 REQ-ROC-URD-0050 REQ-ROC-URD-0040 REQ-ROC-URD-0010	
REQ-ROC-CIRD-0880	The ROC shall be capable of storing at least 32 Terabytes of data over the 10 years of mission. This volume does not include the ROC databases.		
REQ-ROC-CIRD-0890	The ROC shall allocate 3 Terabytes to save its databases content.		