Outcome of the Enquiry on: “DBs Status and needs for HL-LHC Project”

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Context

- The HL-LHC Project Office launched exactly one year ago (18 Jan 2018) an on-line enquiry to *"investigate the status and new Data Base(s) requirements for the HL Project activities and for future LHC Runs after LS2/LS3"* (Memorandum HL-LHC, EDMS #1893421)

- We briefly present here the received answers highlighting the most important issues and actions

Outcome

- We received **13** answers:
  - **3** from TE-VSC
  - **2** from BE-ABP
  - **2** from EN-SMM
  - **2** from TE-MPE
  - **1** from BE-CO
  - **1** from EN-EA
  - **1** from TE-MSC
  - **1** from TE-EPC

- Following the answers analysis, they could be grouped in these 3 categories:
  - **A. DBs that exist and are suitable for HL-LHC**
  - **B. DBs that exist but are NOT suitable for HL-LHC**
  - **C. Proposals for new DBs**

A. DBs that exist and are suitable for HL-LHC

A1. **"Vac-DB"** *(by TE-VSC/WP12. Based on Oracle, Contact: Andre Rocha)*

- *Purpose: is a set of DBs (vachlc@cerndb1; vacsps@cerndb1; vacleir@cerndb1; vacmaster@cerndb1) used to manage VSC control system. They contains all vacuum equipment and configuration.*

A2. **"Queries for VAC"** *(by TE-VSC/WP12. Based on existing Oracle DBs (LHC Layout DB, EDMS, MTF, Contact: Eric Page, Pascal Le Roux)*

- *Purpose: is a set of DBs queries for VSC + optic element HW positions and follow-up (via "VAC Forms").*

A3. **"SQPS, CALS, InforEAM"** *(by TE-MPE/WP7. Based on various standards, Contact: Reiner Denz)*

- *Purpose: set of DBs in use for LHC & QPS system installation, commissioning, operation of devices and control configuration, asset management, etc. There is no a specific HL aspect or matter.*

A4. **"SMTMS, CARPENTER"** *(by TE-MSC/WP16. Contact: Marta Bajko)*

- *Purpose: SMTMS: DB dedicated to LHC magnets tests analysis; CARPENTER: DB dedicated to TF Section activities*

A5. **"TE-EPC DB"** *(by TE-EPC/WP6B. Contact: Michele Martino)*

- *Purpose: Maintenance logbook, spare parts accounting, stand-by/service teams accounting*

***NOTE**: these DBs or system for queries on DBs are tool in use and maintained by different Groups. Improvements and developments are in some cases proposed, but they do not seems imputable to "specific" HL implementation (the open issues are already present now).*

B. DBs that exist but are NOT suitable for HL-LHC (1/2)

B1. **"HLLHC-01, HLLHC V1.3, V1.4"** *(from WP2. Contact: Riccardo De Maria)*

- *Purpose: These namings refer to extractions from the "LHC Layout DB", allowing reconstructing the position of each equipment of the LHC lattice. All this is used in design, production, installation, commissioning, operation. Despite the name (ex. HLLHC-01) some of them are not at all linked with HL-LHC layout. Important development for LS2 and LS3 layout are ongoing*

  (Status as reported: The LHC Layout DB shows inconsistencies and some technical problems, that are now under solution. In fact → following this issue, a WG on "LHC Layout DB upgrade" was launched in June 2018 and is now ongoing be-weekly, *(participants: EN-ACE, BE-CO, HL-WP15 & WP2, TE-VSC).*

B2. **"MMSMA"** *(from EN-SMM/WP15.4 . Contact: P. Bestmann, H. Mainaud Durand, D. Missiaen)*

- *Purpose: Storage of all geometry data linked to LHC machine survey for extra-survey uses*

  (Status as reported : The DB is feed by data provided by Survey Team, but mainly for external users that need to access those data (for their internal use, Survey has another DB: "GEODE"). MMSMA was developed on LHC baseline. Due to its inherent structure (~ 30 tables of data for each magnet) the work requested by HL configuration (new families of magnets) could be quite heavy. This will also depends by who will later use the DB. → Possible actions will be discussed at the HL WGA and will be then reported at TCC.

B3. **"Magnetic and Field Quality Meas. DBs"** *(from HL WGA. Contact: Massimo Giovannozzi, Paolo Fessia)*

- *Purpose: collect all data about magnetic measurements done from manufacturing to final qualification tests*

  (Status as reported : Massimo rise the question about suitability of existing DBs system for Magnetic Measurements for new HL-LHC magnets families and measurements. → The point was discussed with WP3 (Ezio) in a WP2 Meeting. No specific actions seems necessary; agreed that full responsibility for MM data and DB is with TE/MSC-MM and WP3. Ezio could report on this in a future TCC.

B. DBs that exist but are NOT suitable for HL-LHC (2/2)

B4. **"Standard CERN-LHC-Injector DB (layout DB, MTF, LSA, etc.)"** *(from TE-MPE/WP7. Contact: Daniel Wollmann)*

- *Purpose: DB (and queries) linked with LHC Mechanical and Electrical DB for commissioning, operation, maintenance purposes of LHC*

  (Status as reported : The DB must be adapted/upgraded for the HL-LHC and LIU configuration. → eventual checks/actions should be cover by the WG on "LHC Layout DB upgrade" mentioned at point B1).

B5. **"CALS (NXCALS) Logging Layout"** *(from BE-CO/WP18 . Contact: Chris Roderick)*

- *Purpose: is the "core" DB of the Controls Team needed for installation, commissioning, operation*

  (Status as reported : The CALS (Logging) system seems not scalable to future expected data rates and analysis needs for future LHC configurations. → Development are on-going (NXCALS) under the responsibility and within resources of WP18.

C. Proposals for new DBs

C1. Proposal for a "HL-ECR" DB *(by Francisco Sanchez Galan)*

- *Purpose: Centralise and ease handling of changes to LHC equipment for an easier access to changes traceability*

Comment: a new DB seems not necessary. LHC and HL-LHC ECR status, treatments and classification are stored and available in EDMS. For HL-LHC the responsibility is with HL Project Office QA
→ No specific HL actions foreseen.

C2. Proposal for a "EN-SMM-MRO" DB *(by Pawel Ptasznik on behalf of M. di Castro)*

- *Purpose: Database to store the results of all robotic interventions (technical descriptions, devices used, videos) and to keep track of the available equipment for the future needs.*

Comment : This DB should be developed by EN-SMM independently by HL Project since the majority of interventions are not linked with HL-LHC. → No specific HL actions foreseen.

C3. Proposal for a "TE-VSC" DB *(by Cedric Garion)*

- *Purpose: TE-VSC documentation, manufacturing follow-up. Especially information about the exact position/alignment of VSC elements seems missing.*

Comment : If needed this DB should be developed by TE-VSC independently by HL Project. Probably could be developed via MTF and queries on existing DBs. → No specific HL actions foreseen.

Summary

- Enquiry launched within HL-LHC and LHC Machine Teams in Jan-Feb 2018
- 13 answers received, analyzed and classified.
- 1 first action launched with the creation of a WG on “LHC Layout DB upgrade”
- 1 proposal from Survey for a new DB for geo/alignment magnet data seems reasonable due to the impact of HL-LHC specific new magnets and layout *(→ Survey Team will report soon on this).*
- The majority of answers/comments concerns DBs where eventual modifications and developments should be cover by the Depts/Groups within LHC exploitation.
- Evidently, the Project is available to further discuss the proposals/comments or new issues that should appear in future.