

HARDWARE SLM - SERIAL LIFE MODIFICATION

MANAGING HARDWARE MODIFICATIONS

DE-SA/SM
JUNE 2019



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INTRODUCTION

What is SLM?



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1 INTRODUCTION

WHAT IS SLM?

- **Hardware Serial Life Modification (SLM) validates changes in order to:**
 - ✓ Ensure that all required standards are followed.
 - ✓ Guarantee that the documentation is properly updated.
 - ✓ Apply the Alliance's best practices to all hardware parts.
 - ✓ Maintain a “hardware pattern of quality” across the Alliance.
 - ✓ Guarantee the quality and reliability of the final product delivered to the customer.

- **A SLM must be requested for all changes regarding hardware. However, it doesn't apply to software, harness or modifications without ECU impact.**



1 INTRODUCTION

WHAT IS SLM?

■ Examples of hardware modification in serial life:

- ✓ Change of components due to obsolescence.
- ✓ Lead Free migration.
- ✓ Process variations.
- ✓ Production transfer to new plant.
- ✓ Quality improvement (LUP QC).
- ✓ Materials modification.
- ✓ Cost reductions (LUP ECO).
- ✓ Any electronic modification that impacts an ECU.



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1 INTRODUCTION

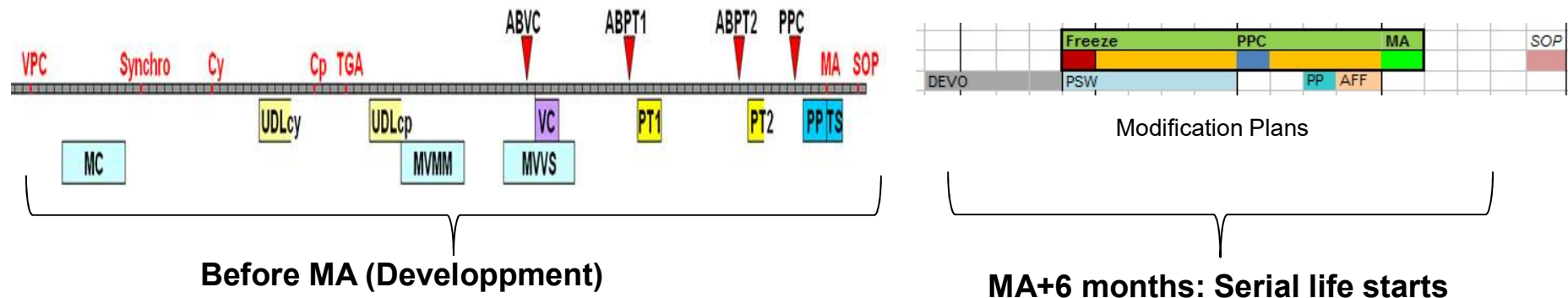
WHAT IS SLM?

- **The SLM consists in the analysis of the following aspects of the hardware:**
 - ✓ Components - addition, removal or replacement.
 - ✓ Circuit - modifications on PCB's layout.
 - ✓ Environment - requirements concerning physico-chemical environment.
 - ✓ Process - variations on manufacturing procedures.
 - ✓ EMC (Electromagnetic Compatibility) - analysis of generation, propagation and reception of electromagnetic energy.



1 INTRODUCTION

WHAT IS SLM?



- **Before MA:** in the development phase the KARTE responsible assures the validation of changes.
- **From MA until MA+6 months: No changes allowed.**
- **After MA+6 months:** Serial Life Process is applicable.
- **Decision criteria:** Application date of modification.
- The total duration of the SLM Process strongly depends on the complexity of the modification and reactivity and feedback of both PDE and Supplier.

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THE SLM PROCESS

How does the SLM process work?



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2 THE SLM PROCESS

HOW DOES THE SLM PROCESS WORK?

- **The SLM is managed with the following file:**  SLM_KARTE_Template_v17
- **In order to request a SLM it is mandatory to provide:**
 - ✓ SLM KARTE.
 - ✓ Detailed presentation of the modification.
 - ✓ Modification request with planning (DCR or PCR).
 - ✓ F4 sheet
- **To initiate the SLM it is necessary to fill up the “Step1 - SLM Opening” spreadsheet with the required ECU information.**
- **The next two slides will guide you through the Step 1.**



2 THE SLM PROCESS

HOW DOES THE SLM PROCESS WORK?

- **Renault responsible / Department** - PDE/PFE/LI name.
- **CUET's name (Optional item)** - Hierarchical responsible name (CUET, CdS, etc).
- **Budgetary Project line (LP)** - SDA Line. **Mandatory.**
- **ECU acronym and complete name** - Name of the part.
- **Supplier name** - Name of the supplier.
- **System name / function description** – eg. Braking for ABS/ESP/ASR.
- **PCBa with coating** – Yes/No.
- **Current PCB assembly plant** - Identification of the supplier's assembly plant.
- **PCB assembly plant after Transfer** - In case of change.
- **Description of the modification** - Brief description of the change.
- **Detailed presentation of the modification** - Attach presentation to e-mail. **Mandatory.**
- **F4 sheet sent to SLM Pilot by e-mail** - You can send a F4 sheet or a Design Change Request (DCR) or a Process/Facility Site Change Request (PFCR).



2 THE SLM PROCESS

HOW DOES THE SLM PROCESS WORK?

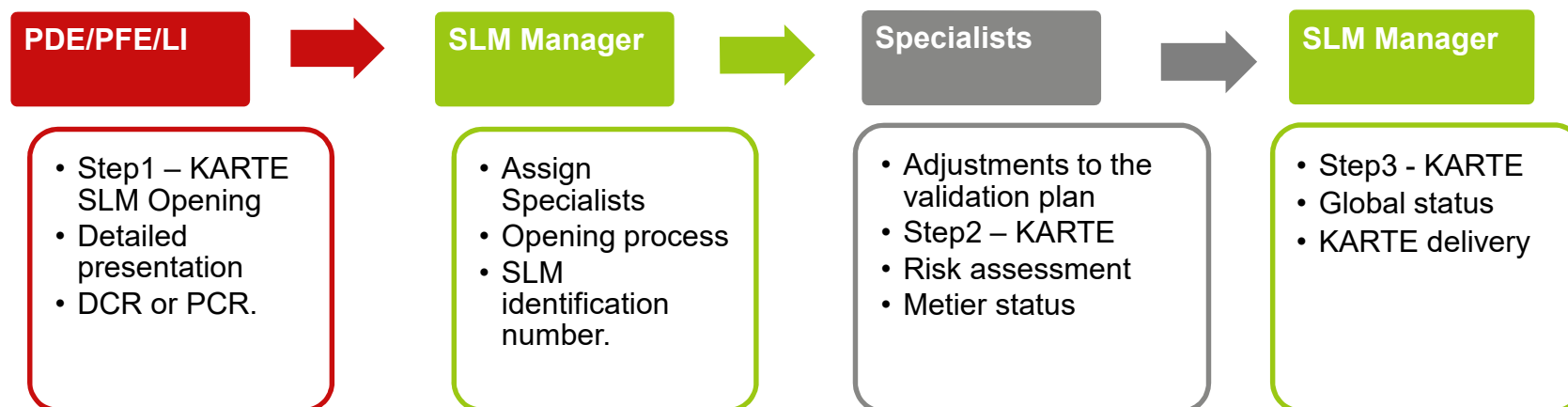
- **Leading Vehicle Project (1st application from development) and Leading Vehicle Project MA date** - Mother project and MA Date (serial life modifications are only allowed after MA + 6 months). **Mandatory.**
- **ECU foreseen PSW date** - Expected PSW date.
- **Application date of the modification in supplier's plant** – Application (MA) at the supplier. **Mandatory.**
- **Foreseen application date of the modification in Renault-Nissan plant** – Application (SOP) at Renault.
- **Carry over projects (Optional item)** - List all the impacted projects (if any).
- **Carry over - Nissan** – Inform if the part was developed by/for Nissan or if it is carry over from Nissan to Renault.
- **LUP number, opening date and application date** - **Mandatory for EMC tests on vehicle** & for closing the SLM.
- **Proof that RNPO was informed about the modification** – The buyer's name and a proof that he/she was informed about the modification.



2 THE SLM PROCESS

HOW DOES THE SLM PROCESS WORK?

- After filling up the spreadsheet, it should be sent to the SLM Manager along with the details of the modification.
- The SLM Manager reviews the information and decides if the SLM is going to be opened.



2 THE SLM PROCESS

HOW DOES THE SLM PROCESS WORK?

- Following the agreement of the validation plan, a F4 Sheet must be filled in order to register the costs if applicable.
- Each specialist will request further information, if needed, for his perimeter.
- Components specialists may request CCR or updated BOM.
- Circuit specialists may request the circuit schematic or Derating check list.
- Environmental and EMC specialists are building a validation plan, or adjusting an already proposed one.
- Process specialists will give their requirements depending on the modification.
- The Supplier then performs the tests and sends the reports in order to be analyzed by the Specialists.



2 THE SLM PROCESS

FINAL STATUSES OF SLM PROCESS

- After finishing the analysis, each specialist will set a status for her/his perimeter.
- Below, the possible metier statuses:

| | |
|---|--|
| DONE/OK | Test results are OK, according to metier standards |
| DONE/NOK | Validation results are NOK, non-AECQ components are used, K50, no compliance with metier standards... etc. |
| Action plan to be followed by project responsible | Modification applied, however some activity ongoing (eg. Testing after application date). Action plan fulfillment to be followed by ECU responsible (PDE/PFE/PCO etc) |
| No impact | No HW reliability impact for the proposed modification |
| No opinion by HW | No information or few information received, testing done by other unknown external standards, no answer for additional requested information... etc. |



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CONTACTS

The SLM Team



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3 CONTACTS

THE SLM TEAM

- **SLM Manager**: Sorin-Cristian RADU.
- **Components**: Stefan CIOCAN, Philip COANDA, Alexandru CAPATINA.
- **Circuit**: Dragos-Cristian MILEA, Philip COANDA, Alexandru CAPATINA .
- **Environment & Mounting** : Stefan-Adrian STOE, Mihai TUDOR.
- **Process**: Florina IARCA, Robert-Gabriel BRIDINEL, Andrei-Marian IONESCU.
- **EMC (Electromagnetic Compatibility)**: Daniel-Adrian GROSS, Radu-Bogdan DRAGOMIR, Radu COMSA, Florin REZMERITA, Lavinia NICA.



3 CONTACTS

THE SLM SUPPORT TEAM

- **RTR Support:**
 - **EMC**: Nacer TITOUCH, Razvan UNGUREANU, Emanuel-Alexandru TURLICA.
- **RTA Support:**
 - **Environment & Mounting**: Diego CINTRA.
 - **Process**: Fabio KLEIN.
 - **EMC**: Alyne JUSTI.
- **RTK Support:**
 - **Components**: Seungyun PARK.
 - **Circuit**: Seungyun PARK.
 - **EMC**: Sunghyun CHOI.



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BEST PRACTICES FOR SLM

Recommendations



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4 BEST PRACTICES FOR SLM

RECOMMENDATIONS

- **It is recommended to request the SLM at least two months before the application date.**
- **The detailed presentation of the modification should contain a planning and a validation plan proposed by the supplier with the following items:**
 - Description of the sample parts for each test.
 - Sequence and duration of the tests.
 - Photos or drawings of the proposed testing setups.
 - Physical points for the tests (application points for EMCs tests).
- **The F4 Sheet should always contain the final validation plan with its respective cost.**



THANK YOU

