Database for upgrade

tables and procedures

Items marked as RED need some more input from the users

Please give feedback!!

V 0.7

19/05/10, 14:48:41

Summary of actions

Composite	Made of the following basic actions
Diode CCE	*is basic*
Diode TCT	*is basic*
Diode qualification	IV, CV
Process qualification	IV, CV, TCAC, TSCINT, TSGCD, TSIVDIELECTRIC, TSMOS, TSRINT, TSSHEET, TSVIA1, TSVIA2
Validation	Those defined in ProbeStation
Signal	*Is basic*
Irradiation	*Is basic*
Annealing	*Is basic*

	DIODES	TS	Baby_PA	Baby_Strixel	Baby_Std	Multi_SSD
Diode CCE, TCT, Qualif	X					
Process qualification		X				
Validation			X	X	X	X
Signal			X	X	X	X
Irradiation	X	X	X	X	X	X
Annealing	X	X	X	X	X	X

Basic actions

- Follows the definition of
  - Diode CCE
  - Diode TCT
  - IV,CV
  - Test structure-specific actions: TCAC, TSCINT, TSGCD, TSIVDIELECTRIC, TSMOS, TSRINT, TSSHEET, TSVIA1, TSVIA2
  - Some actions described in ProbeStation 1/2
  - Signal
  - Irradiation / annealing

Common header

- This header is common to all the actions by definition in the database

Name	Contents	Example/ Comment
Object_ID	Sample barcode	
Test_ID	Unique ID	Given by the database @ upload
Tool_ID	ID of the instrument	Setup used for Experiment:
Test_Center		Institute where the measurement was done
Parent_Action		Used for complex actions
Input_ID	???	???
Operator	Operator_name	Name of person taking measurements
Tdate	Date of the upload	Given by the database
Status	???	???
Output_format	???	???
Comment	Text	Any comment that is important to be given

Common header 2

- These fields will be added to all the test actions in the upgrade database
- Missing measurements in vector are replaced by the 'null' string

Name	Contents	Example/ Comment
Local_ID	Integer	e.g. Filename of locally stored datafile
Temperature	Vector	Temperature in degrees C
RH	Vector	Relative humidity of the environment
Time	Vector	Seconds since start of the measurement
Start	Local date (can be taken from PC)	Start and stop are used for logging the operations only, they are not meant to analyse the data
Stop		
Timestamp	**Integer**	**Taken from cern.ch/timestamp**
Region	Integer	Number of the field in the multi-geometry. Zero for diodes and test structures

Diode CCE

Parameters	*Vmax*	*Value*	*Maximum Voltage used [V]*
	Repetition rate	*Value*	*Repetition frequency [Hz] used for measurement*
	Averaging	*Integer*	*Number of averaging per step*
	Wavelength	*Value*	*Wavelength of laser [nm]*
	Pulse power	*Value*	*Power per pulse (pJ) – estimate*
	Front/back	*Front/back*	*Light injection via front or back electrode*
	Voltages	*Integer*	*Number of Voltages used*
	Measurement mode	*Integer*	*0 = CCE evaluation* *1 = CCE evaluation for reference* *1 = tau_e evaluation* *2 = tau_h evaluation*
Analysis	*CCE*	*Value*	*Collected charge* *(NULL in e.g. measurements for tau_e)*
	CCE_reference	*Value*	*Reference value of collected charge for CCE measurement on non irradiated diode of same type(NULL in e.g. measurements for tau_e)*
	CCE_reference_ID	*Value*	*Measurement_ID of reference data (???)*
	CCE_reference_local	*Value*	*Local_ID of reference file (is this the same as Local_ID, which is there for any action?)*
	Tau_e	*Value*	*Tau_e (or NULL)*
	Tau_h	*Value*	*Tau_h(or NULL)*
Data	*Voltage[j], time[i],value [i], Temperature [i] .....* *Voltage[j+1], time[i],value[i],Temperature[i]* *This means that the voltage for one measurement will appear i-times in the data file: 100V, time[1],value[1],temp[1];100V,time[2],value[2],temp[2],....*		

Diode TCT

- What is the difference with diode CCE?

IV/CV

- IV
  - V_max, N_steps
  - V_Break
  - I_tot[], Voltage[]
- CV
  - V_max, N_steps, step_time
  - C_tot_depl, V_depl, Frequency, I_at_vdepl
  - V_end, C_end
  - Amplitude
  - Mode: Parallel or serial (p/s)
  - Guard ring connection
  - C_tot[], Voltage[], Conductance[]

Test structures actions

- Same as the old TS_PROCESSQUALIFICATION:
  - TCAC, TSCINT, TSGCD, TSIVDIELECTRIC, TSMOS, TSRINT
- New actions
  - IV, CV (see above)
  - TSVIA1, TSVIA2:
    - R_VIA
  - TSSHEET (all floats):
    - R_PPLUS_10, R_PPLUS_20
    - R_NPLUS_10, R_NPLUS_20
    - R_PSTOP_10, R_PSTOP_20
    - R_ALU_10, R_ALU_20
    - R_POLY_5, R_POLY_10, R_POLY_20
    - R_POLY_STRIP, R_POLY_PLONG, R_POLY_PSHORT
    - RHO_PPLUS, RHO_NPLUS, RHO_PSTOP, RHO_ALU, RHO_POLY
- The R_PPLUS, R_NPLUS and R_PSTOP values are different strips in the structure depending on the process (p-on-n or n-on-p). This has to be taken care when creating the DB input files from the measurements
- RHO_* are calculated resistivity for each material and the most interesting final values from the sheet structure

Probe station

- Global
  - Guard ring connection
  - IV, CV (as above)
  - Vfd, I@Vfd, C@Vfd and Vbreak
  - I_at_plateauV, plateauV
- Strip measurements
  - voltageSteps
  - voltage[]
  - stripNumber[]
  - Cint[], Rint[]
  - CAC[], frequency[]
  - Rpoly[], Ileak[], Idiel[]

fill with 1 or more values
If this is a ramp measurement or not

Mostly taken from VALIDATION_1_SEN_, and also IQCMINI_1_SEN_

Probe station 2

- Voltage ramps on 10 strips (strip number)
- Strip measurements:
  - voltage[]
  - stripNumber[]
  - Cint[], Rint[]
  - CAC[], frequency[]
  - Rpoly[], Ileak[], Idiel[]

Mostly in IQCMINI_1_SEN_

Single point → fill in also ramp (with 1 point value)

Signal

- Baby_PA, Baby_Strixel, Baby_Std, Multi_SSD
- Global
  - Voltage[], Temperature[], Current[], Time[], Humidity[]
  - Source position: x[], y[]
  - Position resolution
  - Region, source (laser/beta/particle+EnergyInMeV)
  - MPV of signal (+/- error)
  - Noise[] (+/- error), median
  - Number of clusters, number of events
  - Mean cluster width (mean)
  - Mean cluster noise
  - Common mode (+/- error)
  - Most frequent strip (center of bombarded region)
  - Cluster cuts used (seed/neighbour)
  - Noise cuts (upper / lower limit)
  - MPVSignal[], StripN[]

Example:

proton100

For 100MeV protons

Irradiation / annealing

- Irradiation:
  - Fluence (particles/cm^2)
  - MeVEquivalent (n. 1MeV proton-equivalent)
  - Particle+EnergyInMeV (see above)
  - Irradiation_time
  - Irradiation batch
  - DosimetryFluence (particles/cm^2)
- Annealing:
  - Annealing_time, annealing_temperature (nominal)
  - The actual curve of temperature vs. time comes from the generic info common to all measurements

Progress

Composite	Defined	Table created	Xml sent	Test upload
DIODE CCE	X (...)			
DIODE TCT	X (...)			
Diode qualification	X			
Process qualification	X			
Validation	X			
Signal	X			
Irradiation	X			
Annealing	X			

X: done

Info needed

- Name of your centre
  - Email / phone of responsible
  - Also for irradiation
- List of your tools

References: center

- Name
- Type (add. info)
- Address
- Phone
- Email
- Contact person
- Site (or verbal description)

Reference:
http://indico.cern.ch/materialDisplay.py?contribId=4&sessionId=0&materialId=0&confId=77907

Reference: tools

- If your tool does not exist yet in the table (see reference), define one with
  - NAME, CENTER, operation type and also a description, please
- If it exists, please name it, so we will copy the info and keep the same tool_id

Reference:
http://indico.cern.ch/materialDisplay.py?contribId=4&sessionId=0&materialId=0&confId=77907

XML file example

https://lyosvn.in2p3.fr/constructiondb/wiki/Documentation/Actions#XMLfilesample

```
<?xml version="1.0" encoding="UTF-8"?>
<unit xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="ConstDB.xsd">
    <object id="501TOTO0000001"/>
    <composite>
        <action_description input_id="7" name="VALIDATION" object_name="SEN" version="1"/>
        <action>
            <action_description input_id="3" name="INSPECTION" object_name="SEN" version="1"/>
            <result name="tdate" value="2010-01-15 15:45:23"/>
            <result name="tool_id" value="10"/>
            <result name="operator" value="G. Baulieu"/>
            <result name="bad_strips" value="2 6 15"/>
            <result name="bad_strip_number" value="3"/>
            <result name="piedestal" value="163 123 153 164 142 152 125 136 145 130 128 156 134 125 125 162 134 124 142
163 123 153 164 142 152 143 125 136 145 130 128 156 134 125 125 162 134 124 142 163 123 153 164 142 152 125 136 145 130
128 156 134 125 125 162 134 124 142 163 123 153 164 142 152 125 136 145 130 128 156 134 125 125 162 134 124 142 163 123
153 164 142 152 125 136 145 130 128 156 134 125 125 162 134 124 142 163 123 153 164 142 152 125 136 145 130 128 156 134
125 125 162 134 124 142 163 123 153 164 142 152 125 136 145 130 128 156 134 125 125 162 134 124 142 163 123 153 164 142
152 125 136 145 130 128 156 134 125 125 162 134 124 142 163 123 153 164 142 152 125 136 145 130 128 156 134 125 125 162
134 124 142 163 123 153 164 142 152 125 136 145 130 128 156"/>
            <result name="status" value="reference"/>
            <result name="tcomment" value="no comment"/>
            <result name="INSPECTION_val" value="1"/>
        </action>
        <action>
            <action_description input_id="5" name="RESISTIVITY" object_name="SEN" version="1"/>
            <result name="tdate" value="2010-01-15 15:47:48"/>
            <result name="tool_id" value="10"/>
            <result name="operator" value="G. Baulieu"/>
            <result name="broken_strips_number" value="2"/>
            <result name="status" value="reference"/>
            <result name="tcomment" value="no comment"/>
            <result name="RESISTIVITY_val" value="1"/>
        </action>
    </composite>
</unit>
```

Once your table is created you can download an empty xml sample file from the BigBrowser

XML file example

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BigBrowser

- The latest version of BigBrowser is available here

  https://lyosvn.in2p3.fr/constructiondb/wiki/Download

- Along with the instructions on how to install it on your favourite OS

Object/types name scheme

In the database, objects are described using 3 fields :

- **Object** : SEN, MOD, ROD, HYB ...
- **Type** (subset of object) : EC_R6P.4U, OB1...
- **Version** (subset of type) : prototype, bug corrections...

Solution:

Object : SEN

Type : MULTISSD Substrate_1, MULTISSD Substrate_2, MULTIPIX Substrate_1, MULTIPIX Substrate_2, ...

+ 1 table per test (same table for all sensors : IRRADIATION_1_SEN)
- All sensors are stored under the same label SEN. One must use the type to distinguish them.