Product registration during DOM integration at Nikhef

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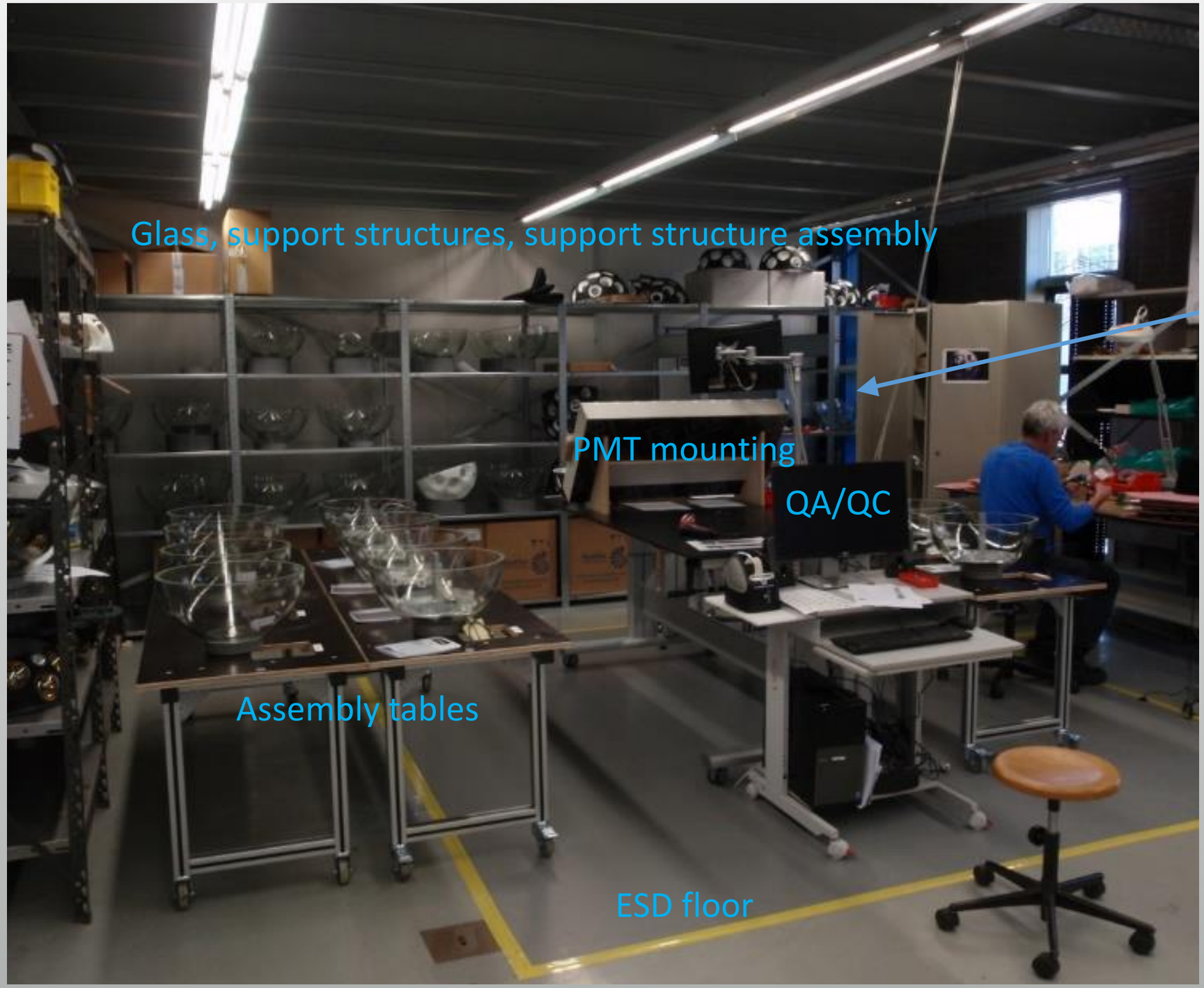
Nikhef KM3NeT Group Meeting
March 10 2015


Glass, support structures, support structure assembly
PMT mounting
QA/QC
Assembly tables
ESD floor

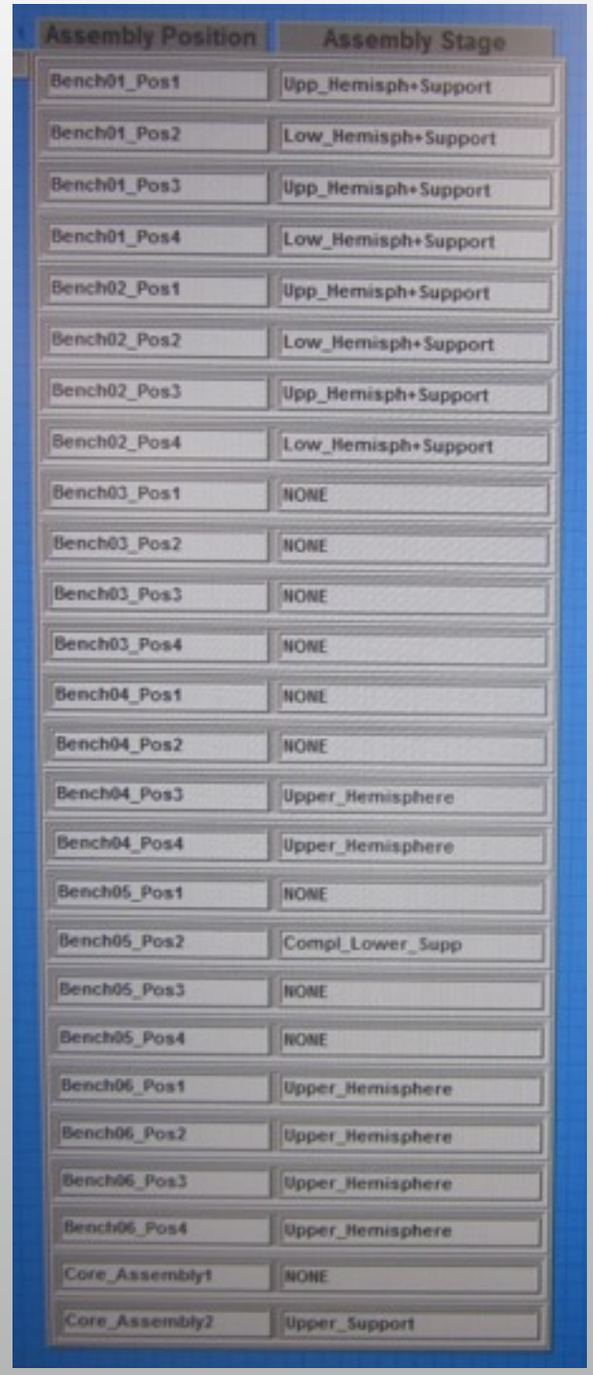
Why register products?

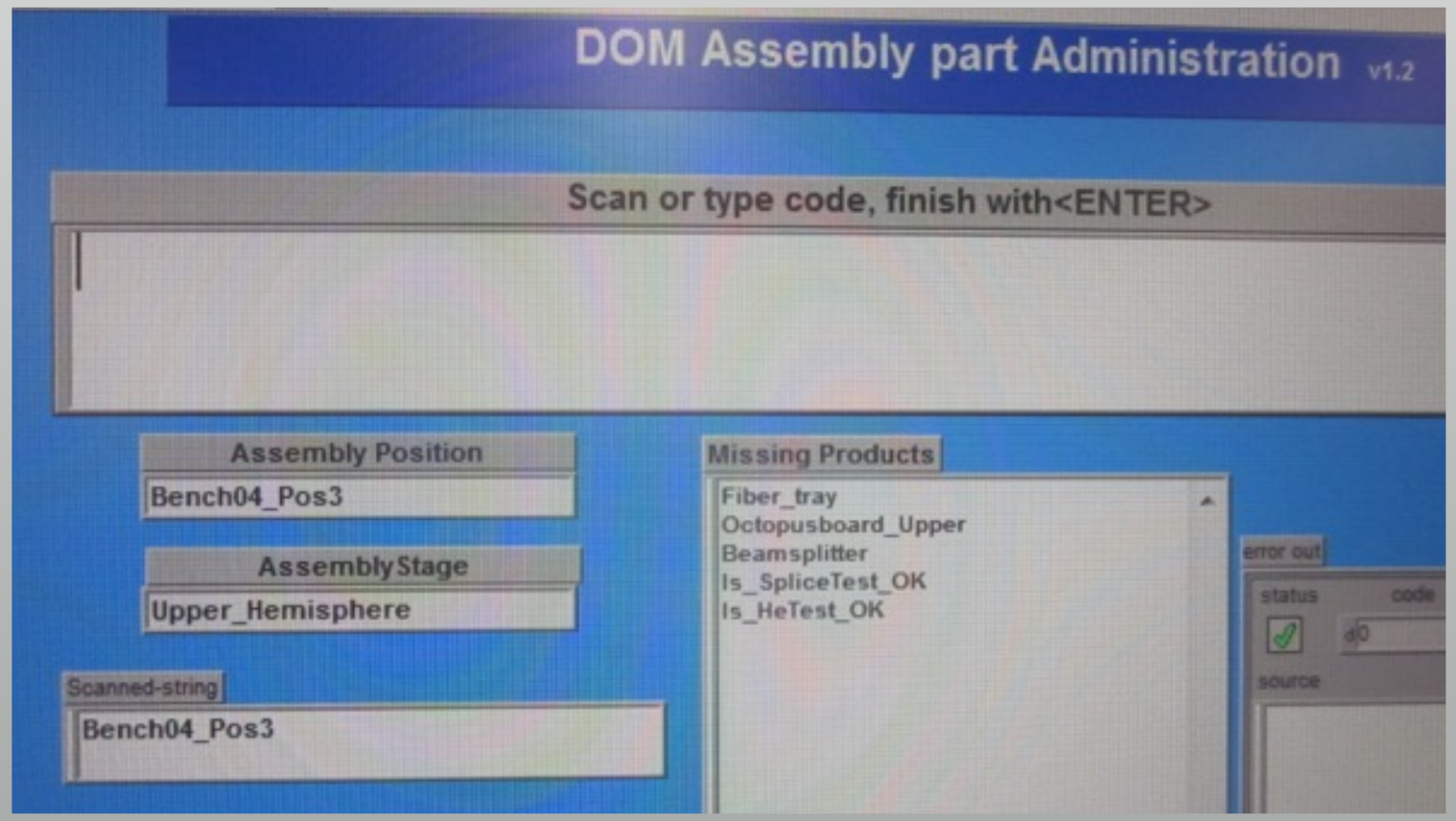
- Two goals:

1. **DAQ:**
    - Which CLB, piezo, nano beacon, Octopus boards?
    - Which PMT is where?
2. **QA/QC:**
    - To trace (batches of) products back if we ever find a problem with (certain) DOMs

Setup at Nikhef

- A PC with two LabView VI's running that reads from and writes to a (local!) Access database:
  - Overview program (reads current state of Bench Positions)
  - Product registration program (writes to DB)
- We make use of a QR-code scanner connected as keyboard input





Main objects

- The VI's work with the following main "objects"
- Bench Positions
- Assembly Stages
- Actions

Bench positions

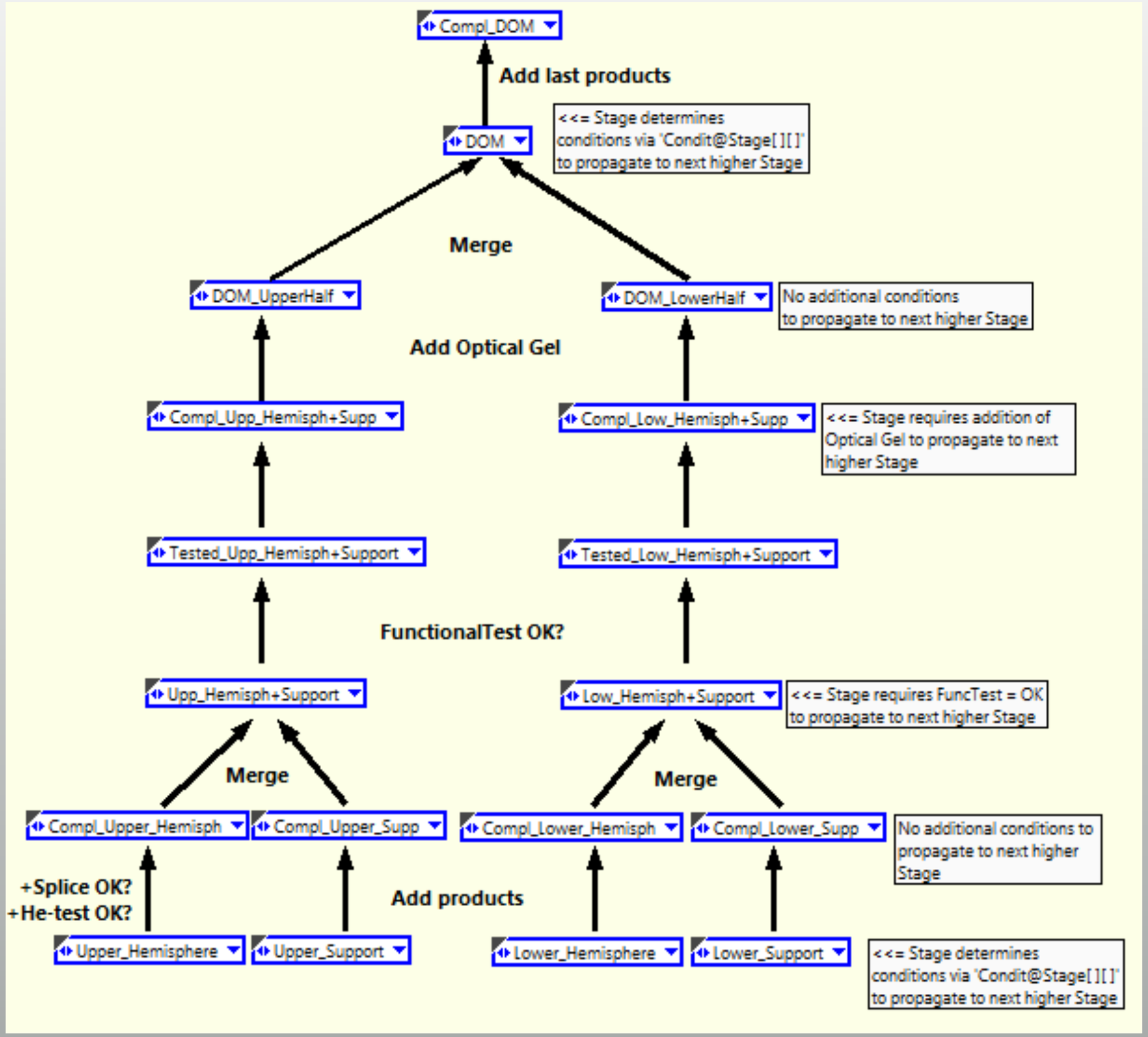
- Bench01_Pos1 - Bench01_Pos4

- …
- Bench06_Pos1 - Bench06_Pos4

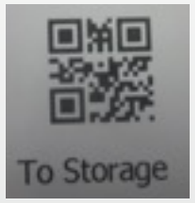
- Core_Assembly1 - Core_Assembly2

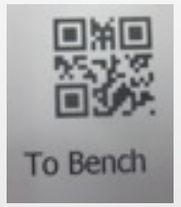
- Store01_Pos01 - Store01_Pos10

Assembly Stages



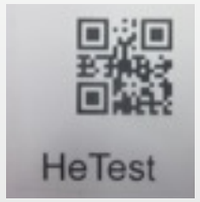
Actions

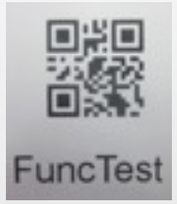


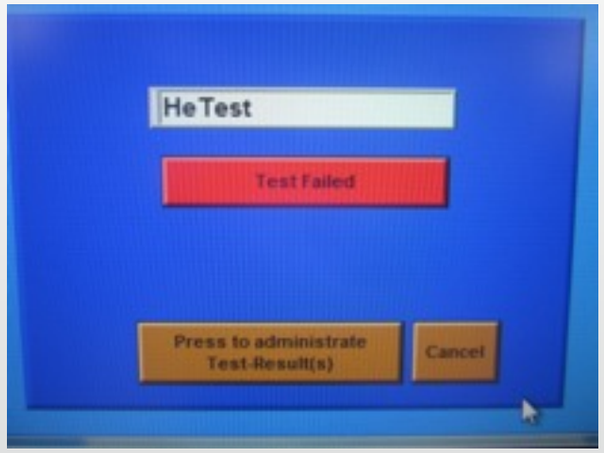


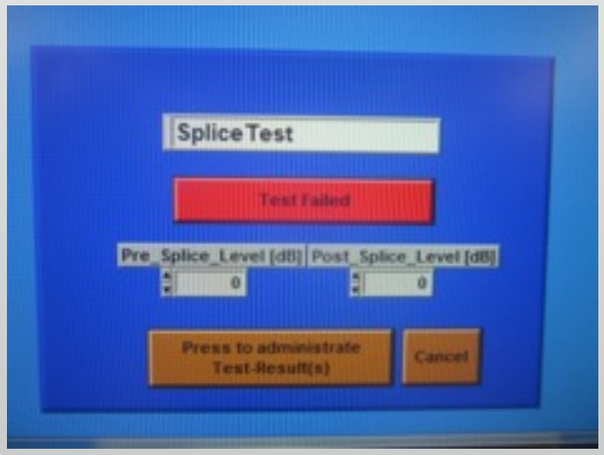
- **Merge**
  - Usage: scan <<Merge>>, scan <<1st bench pos>>, scan <<2nd bench pos>>
  - In database, it cuts the products in the row from <<2nd bench pos>> and pastes them to their corresponding columns in the row for <<1st bench pos>>, filling the ‘gaps’.
  - Check on Assembly Stages to see if Merge is allowed
  - <<2nd bench pos>> Assembly Stage changed to “None” —> position is free
- **To Storage**
  - Usage: scan <<bench pos>>, scan <<To Storage>>, scan <<store pos>>
  - In database, it cuts all products in the row from <<bench pos>> and pastes to <<store pos>>
  - <<bench pos>> Assembly Stage changed to “None” —> position is free
- **To Bench**
  - Other way around from “To Storage”
- **Replace**
  - Usage: scan <<Replace>>, program will ask what product needs replacement at this <<Bench Pos>>. Select the product. The program will ask for the new UPI.

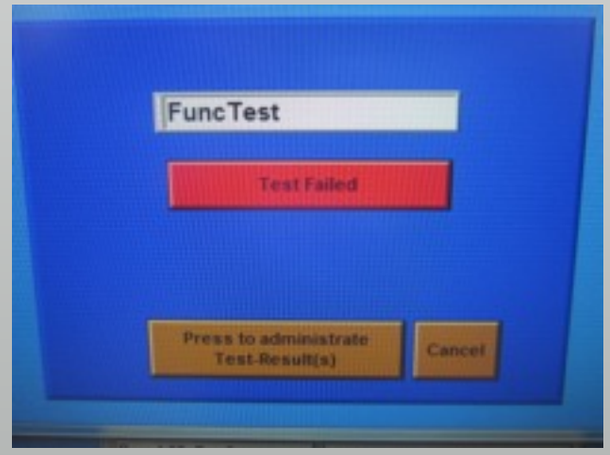
Actions: tests











- **He Test:**
  - Usage: scan <<He Test>>, click “Test Failed” to change the dialog to “Test Passed” and press <<administrate>>
- **Splice Test:**
  - Idem, but also enter optical attenuation before and after splice
- **Func Test:**
  - As He Test
  - Work to be done here. Still awaiting an official Test Procedure (Giorgio?). What do we want to register?
  - And is this the way to register, or do we want dedicated Functional Test sheets to be parsed to KM3NeT DB?

Database tables

- UPI administration
- Operator
- Timestamp

  Rows: a row for every bench position

  Columns: bench position, assembly stage, products, tests

- Finished DOM UPI
- Finished DOM operator
- Finished DOM timestamp

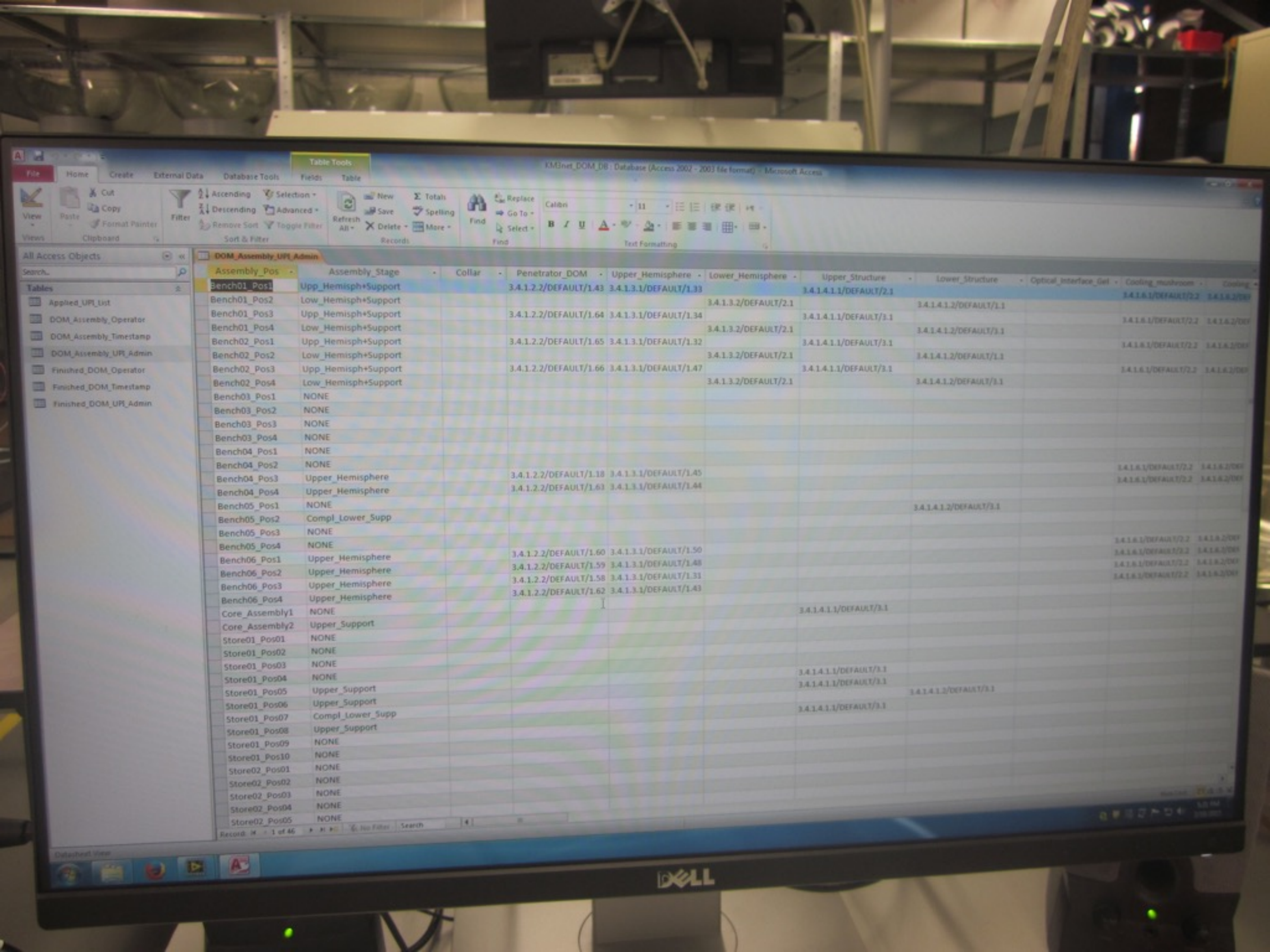
  Rows: a row for every completed DOM

  Columns: products, tests

- Applied UPI list

  Rows: a row for every unique product (no duplicates allowed!!!)

  Columns: UPI



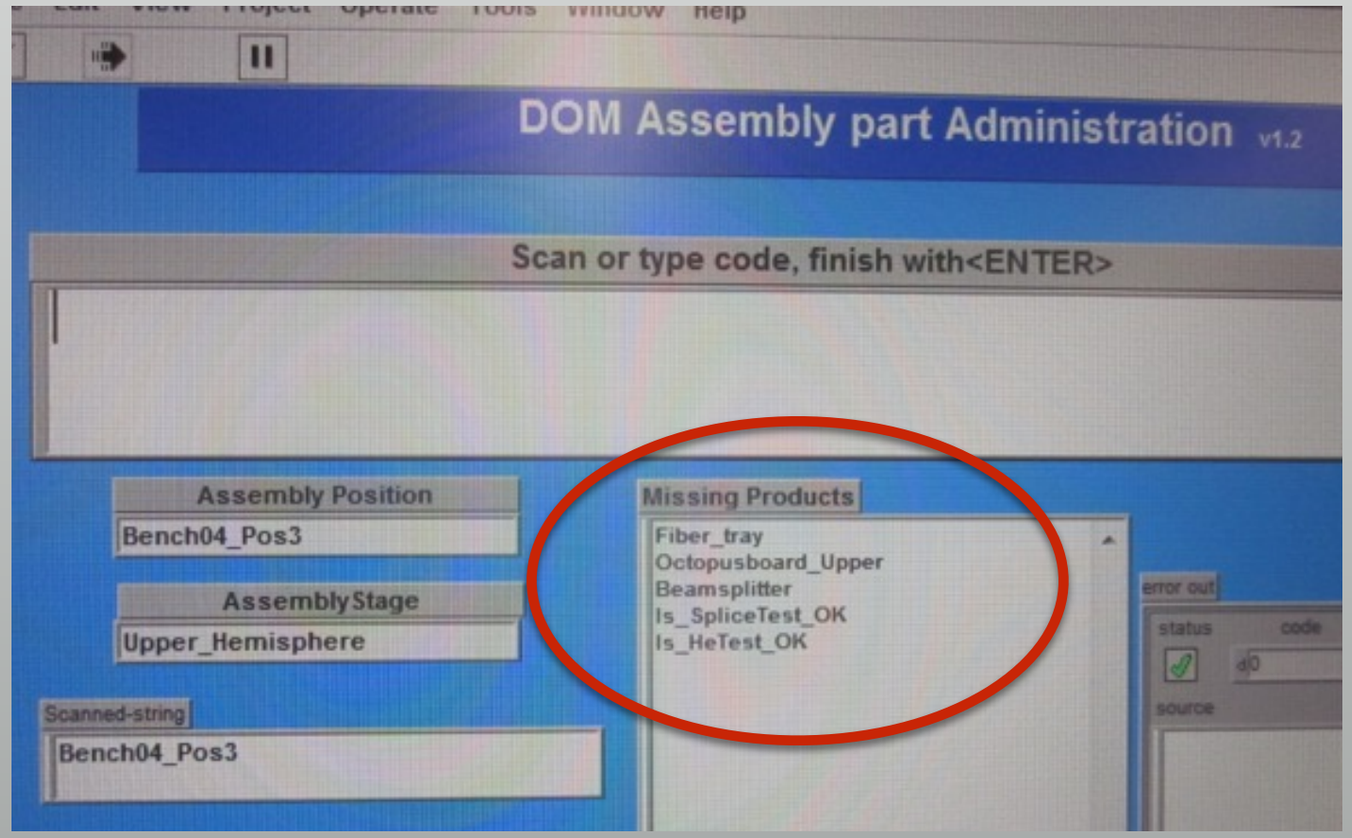
KMJnet_DOM_DB : Database (Access 2002 - 2003 file format) - Microsoft Access

DOM_Assembly_UPI_Admin

Assembly_Pos	Assembly_Stage	Collar	Penetrator_DOM	Upper_Hemisphere	Lower_Hemisphere	Upper_Structure	Lower_Structure	Optical_Interface_Gel	Cooling_mushroom	Cooling
Bench01_Pos1	Upp_Hemisph+Support		3.4.1.2.2/DEFAULT/1.43	3.4.1.3.1/DEFAULT/1.33		3.4.1.4.1.1/DEFAULT/2.1				
Bench01_Pos2	Low_Hemisph+Support				3.4.1.3.2/DEFAULT/2.1		3.4.1.4.1.2/DEFAULT/1.1			
Bench01_Pos3	Upp_Hemisph+Support		3.4.1.2.2/DEFAULT/1.64	3.4.1.3.1/DEFAULT/1.34		3.4.1.4.1.1/DEFAULT/3.1				
Bench01_Pos4	Low_Hemisph+Support				3.4.1.3.2/DEFAULT/2.1		3.4.1.4.1.2/DEFAULT/3.1			
Bench02_Pos1	Upp_Hemisph+Support		3.4.1.2.2/DEFAULT/1.65	3.4.1.3.1/DEFAULT/1.32		3.4.1.4.1.1/DEFAULT/3.1				
Bench02_Pos2	Low_Hemisph+Support				3.4.1.3.2/DEFAULT/2.1		3.4.1.4.1.2/DEFAULT/1.1			
Bench02_Pos3	Upp_Hemisph+Support		3.4.1.2.2/DEFAULT/1.66	3.4.1.3.1/DEFAULT/1.47		3.4.1.4.1.1/DEFAULT/3.1				
Bench02_Pos4	Low_Hemisph+Support				3.4.1.3.2/DEFAULT/2.1		3.4.1.4.1.2/DEFAULT/3.1			
Bench03_Pos1	NONE									
Bench03_Pos2	NONE									
Bench03_Pos3	NONE									
Bench03_Pos4	NONE									
Bench04_Pos1	NONE									
Bench04_Pos2	NONE									
Bench04_Pos3	Upper_Hemisphere		3.4.1.2.2/DEFAULT/1.18	3.4.1.3.1/DEFAULT/1.45						
Bench04_Pos4	Upper_Hemisphere		3.4.1.2.2/DEFAULT/1.63	3.4.1.3.1/DEFAULT/1.44						
Bench05_Pos1	NONE						3.4.1.4.1.2/DEFAULT/3.1			
Bench05_Pos2	Compl_Lower_Supp									
Bench05_Pos3	NONE									
Bench05_Pos4	NONE									
Bench06_Pos1	Upper_Hemisphere		3.4.1.2.2/DEFAULT/1.60	3.4.1.3.1/DEFAULT/1.50						
Bench06_Pos2	Upper_Hemisphere		3.4.1.2.2/DEFAULT/1.59	3.4.1.3.1/DEFAULT/1.48						
Bench06_Pos3	Upper_Hemisphere		3.4.1.2.2/DEFAULT/1.58	3.4.1.3.1/DEFAULT/1.31						
Bench06_Pos4	Upper_Hemisphere		3.4.1.2.2/DEFAULT/1.62	3.4.1.3.1/DEFAULT/1.43						
Core_Assembly1	NONE					3.4.1.4.1.1/DEFAULT/3.1				
Core_Assembly2	Upper_Support									
Store01_Pos01	NONE									
Store01_Pos02	NONE									
Store01_Pos03	NONE					3.4.1.4.1.1/DEFAULT/3.1				
Store01_Pos04	NONE					3.4.1.4.1.1/DEFAULT/3.1				
Store01_Pos05	Upper_Support						3.4.1.4.1.2/DEFAULT/3.1			
Store01_Pos06	Upper_Support					3.4.1.4.1.1/DEFAULT/3.1				
Store01_Pos07	Compl_Lower_Supp									
Store01_Pos08	Upper_Support									
Store01_Pos09	NONE									
Store01_Pos10	NONE									
Store02_Pos01	NONE									
Store02_Pos02	NONE									
Store02_Pos03	NONE									
Store02_Pos04	NONE									
Store02_Pos05	NONE									

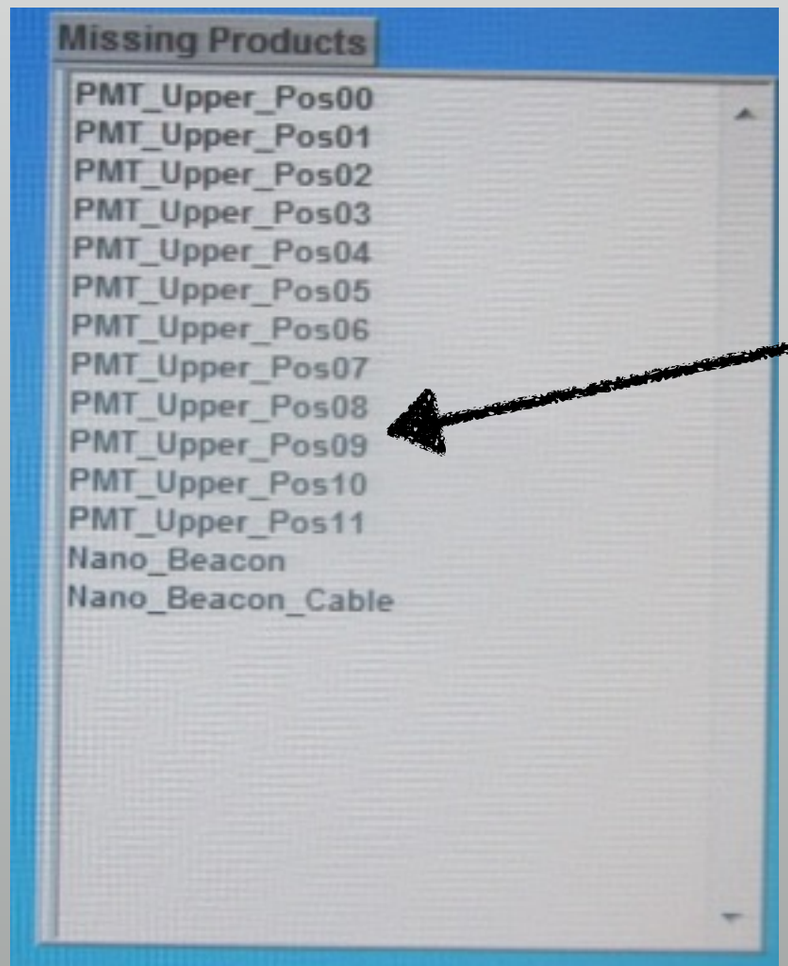
VI is integration checklist

- Every Assembly Stage demands a number of products and/or tests to advance to the next Assembly Stage
- This is represented in the Missing Products List
  - Note: A test is treated as a product in this case



Special case: PMT integration

- Integration of the PMTs is special:
  - We also need to record the position in the mechanical structure
- Whenever a PMT QR is scanned, the VI tells the user he/she should scan a position first, and only then scan the PMT QR.
- Only then will a PMT *position* disappear from the Missing Product List



Usage of local database

- Currently for DOM test setup (Linux system):
  - Python script to dump UPI table from Access to CSV file.
    - If someone has a better idea, please…
  - Read the CSV file, store rows as python lists
  - Do whatever you want:
    - Write to Excel/XML file (for upload of integration info to KM3NeT DB)
    - Get PMT HV settings from KM3NeT DB
      - See example at /home/dom0user/Documents/PMT_HV_settings/Get_PMT_HV_settings.py on kennet
    - …

For DOM testers

- Very important to note which DOM half you're picking up from which Bench Position

- You need that information to get correct PMT HV settings from KM3NeT DB

- Very important to put back the DOM half at its original position!

DOM identification

- When mounting an upper hemisphere on a Bench Position, we decide *beforehand* which DOM this upper hemisphere is going to be.

- Do we still want to keep a local count? This number is NOT used in our local DB nor in the KM3NeT DB

- Only used so far in the tests —> better to use UPI?

- Then how to identify lower halves?

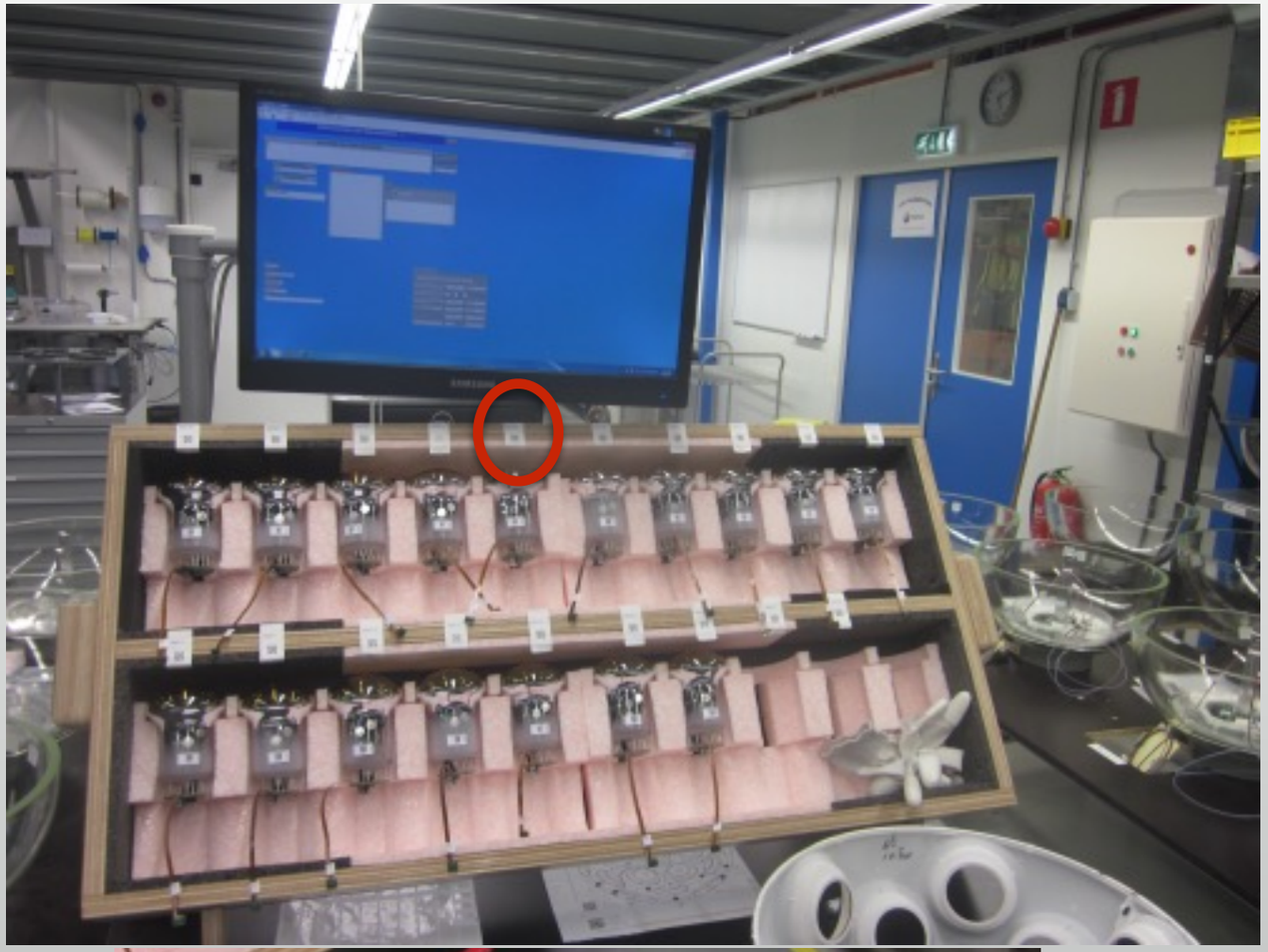
- Do we need keep halves together?

Integrate SFP channel 38C!!!

Conclusions

- At Nikhef, we use a Windows PC with a Tabview VI to register products during DOM integration
- Note which DOM (half) you pick up from which Bench Position before testing
- Be sure to put back the DOM (half) at the correct Bench Position after testing
- To do:
  - What and how do we want to register for tests?

PMT mounting



Slightly off-topic, but VERY useful and safe for PMT integration!