# OB module: further definition of increment1

20250106

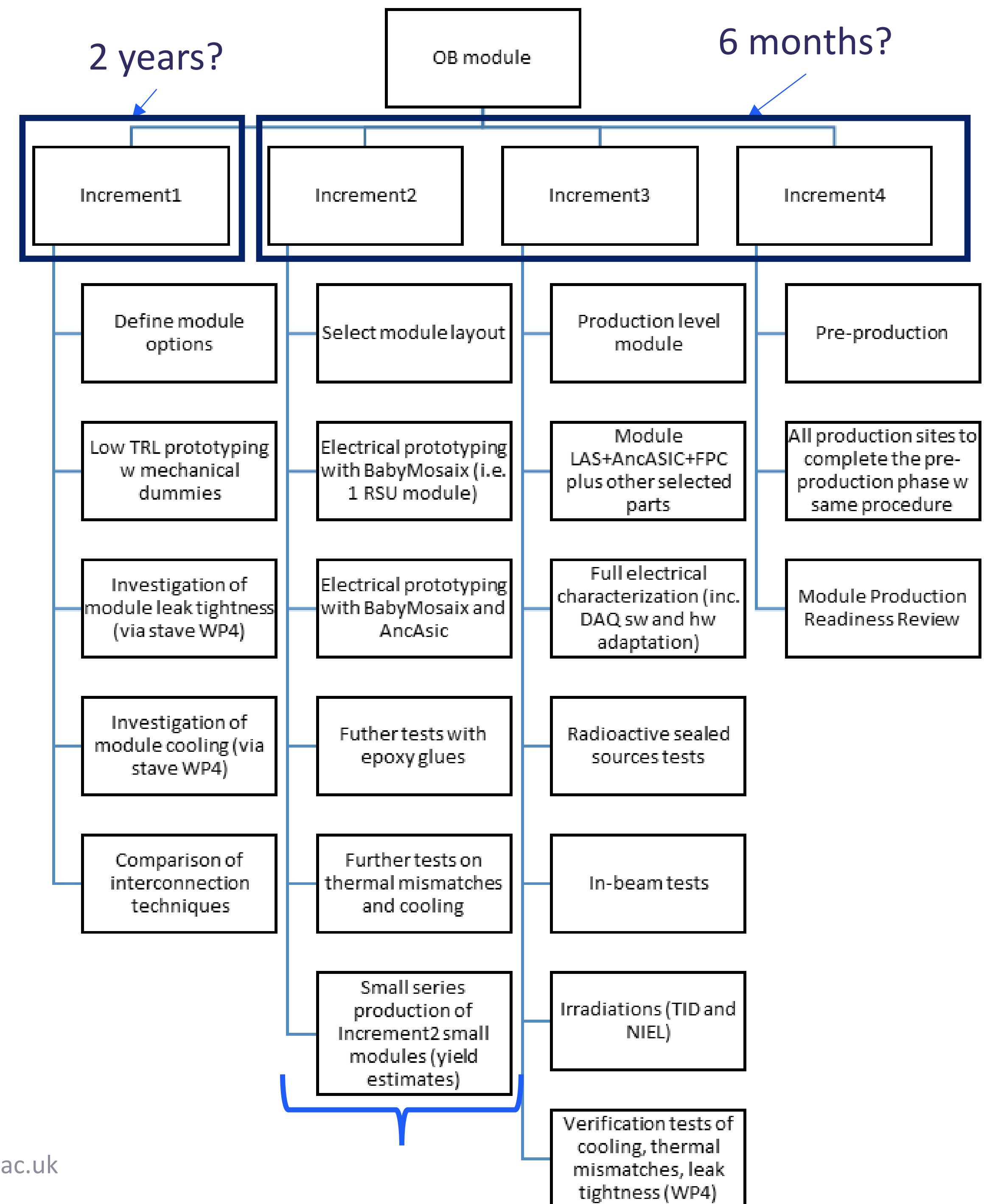
M.Borri

Science and Technology Facilities Council

# Incremental development

Key dates: (from Peter's submitted proposal)

- LAS design/characterization ends on
  - 30/09/2027 (design)
  - 31/12/2027 (characterisation)
- AncAsic design/testing ends on
  - 01/08/2026 (design)
  - 30/09/2027 (testing)
- Module pre-production completed by 31/06/2028.



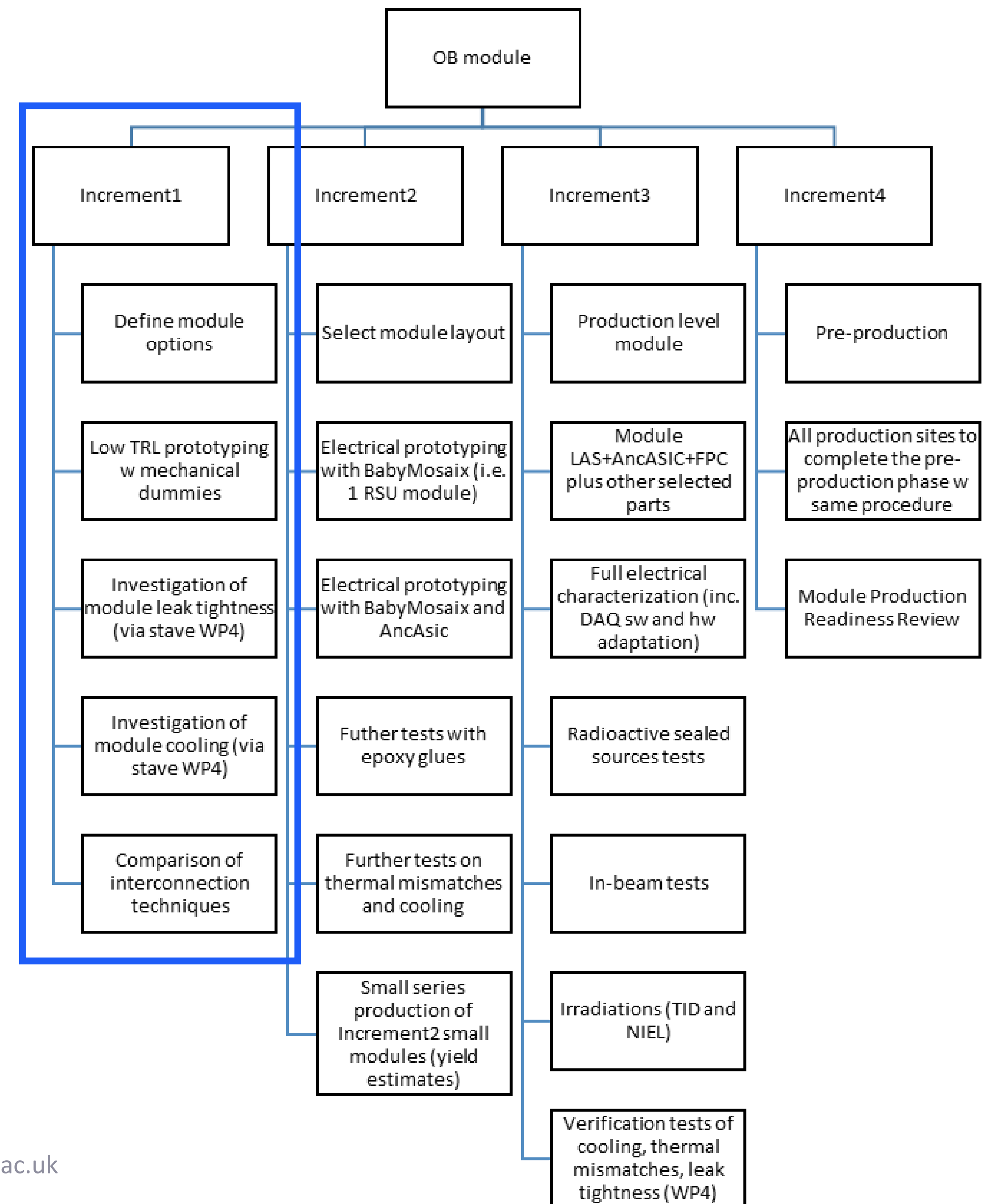

Science and Technology Facilities Council

marcello.borri@stfc.ac.uk

# Increment 1 (part1)

- Define module options:
  - K.Davies to model different options:
    - 2 LAS + 2 AncAsic + FPC on bottom
    - 2 LAS + 2 AncAsic + FPC on top
    - 2 LAS + 2 AncAsic + FPC on top + CFF plate
    - 1 LAS + 1 AncAsic + FPC on top

- Low TRL prototyping w mechanical dummies:
  - LAS dummy:
    - material (Si or glass or other) (Si already available)
    - features (thickness, metallisation)
  - AncAsic dummy:
    - material (Si or glass or other)
    - features (thickness, metallisation)
  - FPC dummy:
    - materials (Polyimide)
    - features (thickness, metallisation)

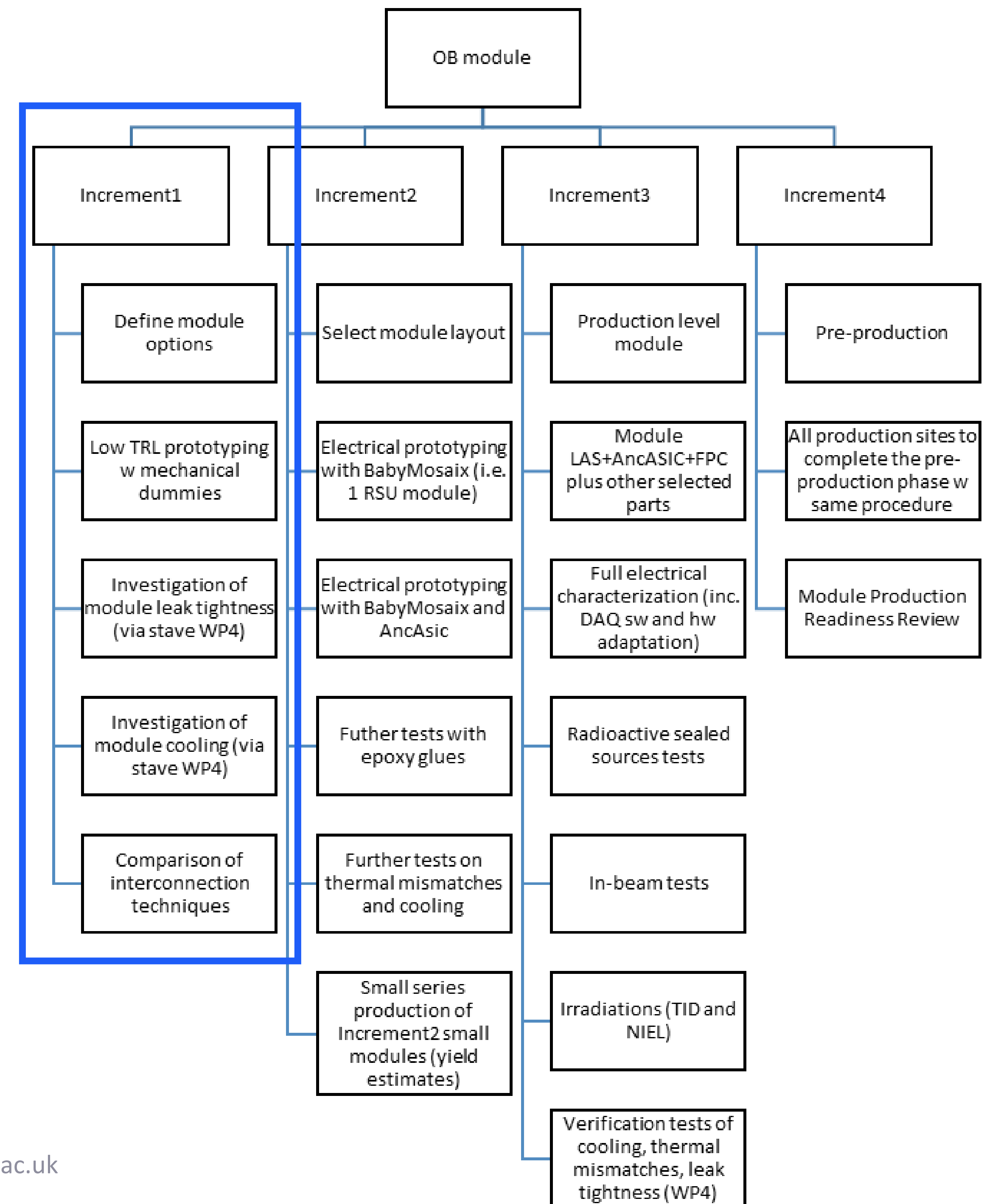



Science and Technology Facilities Council

marcello.borri@stfc.ac.uk

# Increment 1 (part2)

- Low TRL prototyping w mechanical dummies: (continued)
  - Tooling:
    - Module baseline: 2 LAS + 2 AncAsic + FPC (top/btm)
    - Requirement: components alignment;
  - Glue:
    - Glue type: Araldite 2011
    - Glue deposition: glue robot; glue stencils;
- Investigation of module leak tightness:
  - Via stave WP4;
- Investigation of module cooling:
  - Via stave WP4;
- Comparison of interconnection techniques:
  - LTU to provide daisy chain test structures;
    - 1 type only spTAB;
    - 1 type only wire-bonding;




Science and Technology Facilities Council

# Conclusion

- Presented areas of work for increment 1
- To further improve the definition of stage 1  prototyping

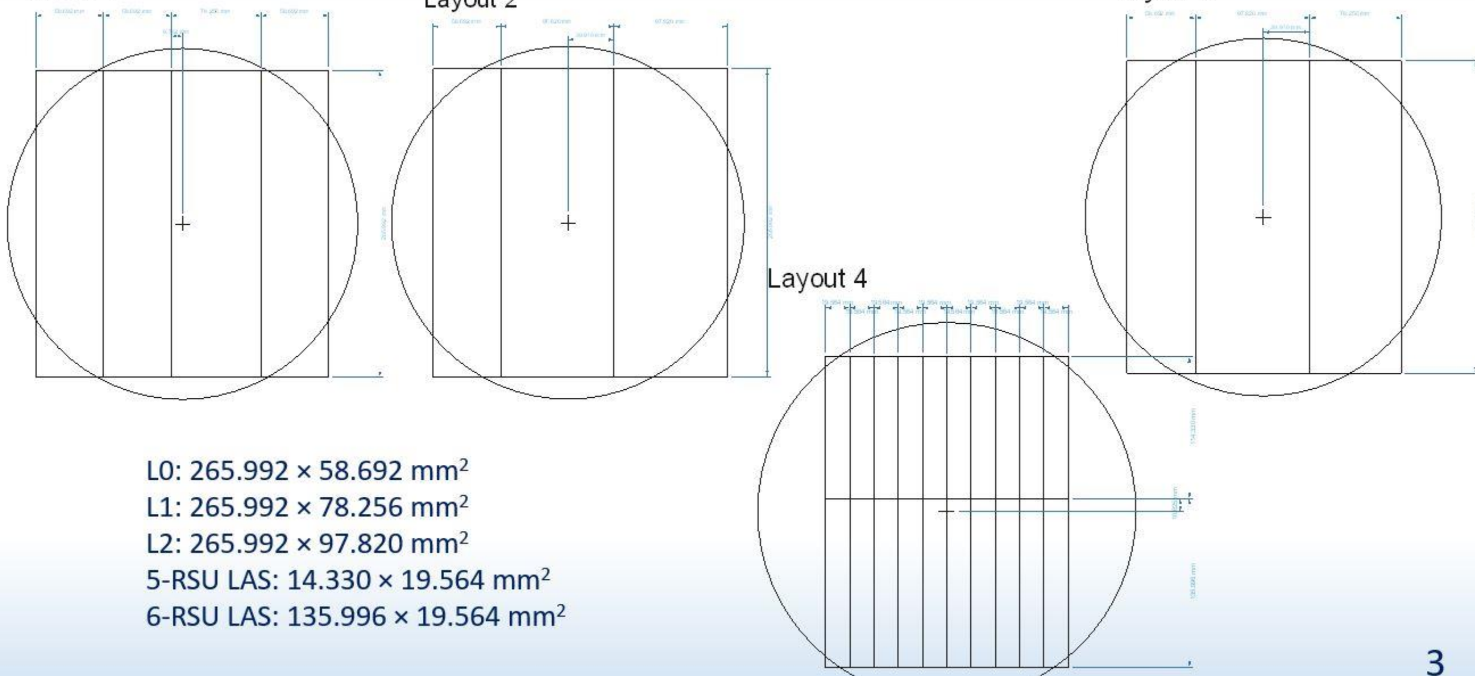
Science and
Technology
Facilities Council

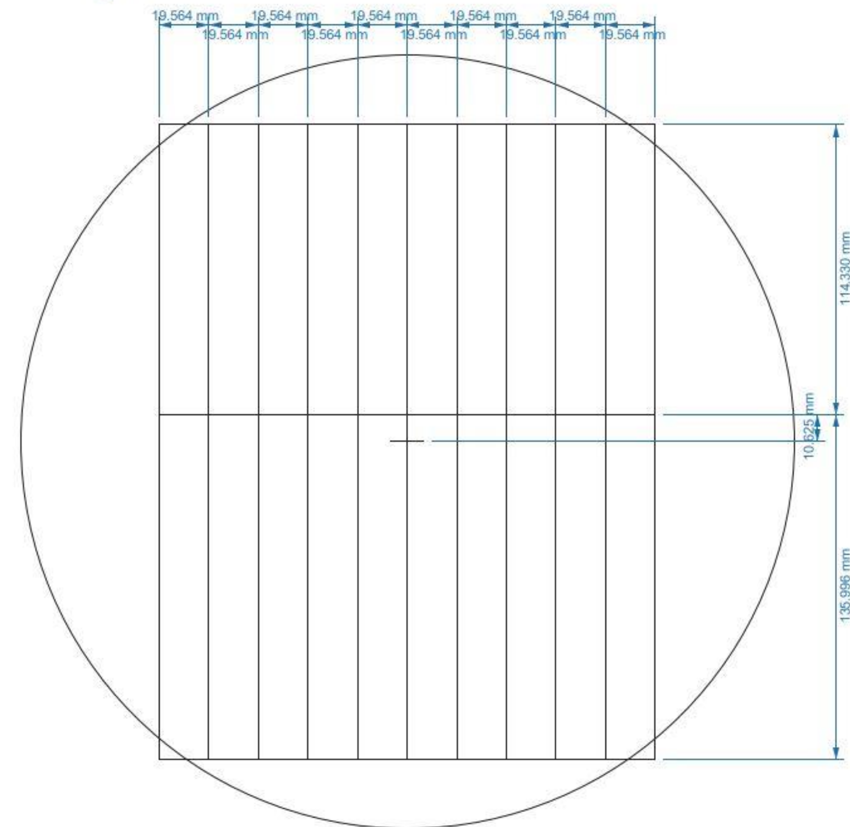
marcello.borri@stfc.ac.uk

# Back-up

Slides from G.Viehhauser

Science and
Technology
Facilities Council






…Wafers should be 40um thick.

...I think there are a total of 96 LAS dummies that will be encapsulated for us and the disks. (~43 for OB, mainly T6).

Science and Technology Facilities Council

marcello.borri@stfc.ac.uk

# New numbers

| Layout | Per wafer (full/chopped) | | | | | Number of wafers | Total | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L0 | L1 | L2 | 5-RSU LAS | 6-RSU LAS | | L0 | | L1 | | L2 | | 5-RSU LAS | | 6-RSU LAS | |
| | | | | | | | full | chopped | full | chopped | full | chopped | full | chopped | full | chopped |
| 1 | 1/2 | 1/- | | | | 8 | 8 | 16 | 8 | | | | | | | |
| 2 | -/1 | | 1/1 | | | 8 | | 8 | | | 8 | 8 | | | | |
| 3 | -/1 | -/1 | 1/- | | | 8 | | 8 | | 8 | 8 | | | | | |
| 4 | | | | 8/2 | 8/2 | 8 | | | | | | | 64 | 16 | 64 | 16 |
| Total | | | | | | **32** | 8 | 32 | 8 | 8 | 16 | 8 | 64 | 16 | 64 | 16 |
| To be encapsulated | | | | | | | 4 | | 4 | | 8 | | 48 | | 40 | |

- 32 wafers instead of 26
- Less LAS, but still sufficient for prototyping



Science and Technology Facilities Council

marcello.borri@stfc.ac.uk