Development plan for SWGO Element Proposals

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Next steps

Development plan for SWGO Element Proposal: XXXXX

SWGO Detector Element/Chain Development Plan Template (v1.0 16th Nov. 2023)

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Next steps

1 Status

This development plan refers to the element proposal HAP-23-025 and associated gitlab issue 17. EXAMPLE! ADAPT!

The element is currently at Technological Readiness Level (TRL) X.

Groups in institutes X and Y are working together to advance the TRL to 7 by (date).

The Design Consolidation Report discusses this element as a promising option as part of a detector chain together with XXX.

The Advisory Group Report states: "quotation". We consider that .... and address the concerns raised in the development plan outlined below.

Development Plans addressing a chain of elements are explicitly allowed/encouraged. If this is the plan for a chain just list the elements here and give the TLR of each.

Next steps

2 Plan Description

Description of the plan. Should address

- how to reach TRL 7 by June 2024?
- how/when will be performance be demonstrated?
- how/when will interfaces to other elements in the chain be demonstrated?
- how/when will detailed cost information (at full scale) be obtained?
- how/when will reliability be characterised?
- how/when will plans (and associated risks) for production be addressed?
- how/when will plans for deployment/AIV and on-site operations inc. maintenance be derived, and associated risks analysed?

Note that TRL 7 corresponds to: **Small batch production, lab verification testing. A representative number of units have been produced and tested.**. The batch produced must be of a design that already has verified performance (TRL 4), validated interfaces to element proposals for neighbouring elements (TRL 5), and proven reliability (TRL 6).

Next steps

Milestone	Description	Associated TRL	Goal Date
M1	Interfaces verified and fixed	5	Feb 2024
M2	Report on long-term reliability testing released	6	April 2024
M3	Report from testing of ten units of final design released	7	June 2024
...			

Tab. 1 Summary of milestones in the development plan.

Further note that it is not possible to advance beyond TRL 4 without a simulation model which adequately matches the performance of the element or chain. Plans for development and integration of the simulation model should therefore also be captured in the plan.

3 Milestones

Provide a table of milestones for the development of this element or chain, with at least one milestone per TRL level advanced.

Present status (In the DCR)

	Proposal	Label	Base Concept					Deployment Type			Array Zone		PBS Item		
			F	E	A	G	M	Tank	Pond	Lake	Inner	Outer	1.1	1.2	1.3
✓	22-012	Field Node	○	○	○	○	○	◉	○	○	○	○			◉
✓	22-013	Multi-PMT Elec.		◉		○		○	○	○	○	○			◉
✓	23-002	White Rabbit	○	○	○	○	○	○	○	○	○	○			◉
✓	23-004	Phantom HV	◉	○	◉	○	○	○	○	○	○	○			◉
✓	23-005	Multi-PMT		◉		○		○	○	○	○	○		◉	
✓	23-007	ActiveBase	○	○	○	○	○	○	○	○	○	○		◉	
✓	23-009	WLS+SiPM		◉		◉		◉	○	○	○	○		◉	
✓	23-011	Lake	○	○	○	○				◉	○	○	◉		
	23-012	Bladder Film	○	○	○	○	○	○	○	○	○	○	◉		
✓	23-013	Lake Cage	○	○	○	◉				◉	○	○	◉		
✓	23-014	SiPM Cones				◉		○	○	○	○	○		◉	
✓	23-015	Open Pond	○	○	◉				◉		◉		◉		
	23-018	Metal Tank	◉	○	◉	○		◉			○	○	◉		
✓	23-019	MicroBase	○	○	○	○	○	○	○	○	○	○			◉
	23-021	Outer WCD	○	○	◉	○		◉		◉		◉	◉		
✓	23-023	Plastic Tank		◉				◉			○	○	◉		
	23-024	Deep Muon					◉			◉	○	◉	◉		
	23-025	Large PMTs	◉	○	◉	○	○	○	○	○	○	○		◉	
✓	23-026	WLS Plate			○	◉		○	○	○	○	○		◉	
✓	23-027	Hemisphere				◉		◉				◉	◉		
	23-032	PMT+Fibre	○	○	○	○	◉	○	○	◉	○	◉		◉	

+ Some

Present status (NOT in the DCR)

- R&D plan for Positioning and time synchronization module
- R&D plan for SWGO System Integrated Mechanical Design