

Milestone Table

Overall Milestone List										
<u>Milestone No.</u>	<u>Work Package</u>	<u>Milestone Description</u>	<u>Baseline Date</u>	<u>Target Date</u>	<u>Actual Completion Date</u>	<u>Status</u>	<u>Other Collaborators?</u>		<u>Affects Critical Path?</u>	<u>See Note</u>
M1.1	WP1	Review of existing and proposed targets for high power neutron production	1 Jun 12	31 Oct 12	21 Sept 12	Stephen Brooks+Chris Densham A Bungau?		SNS BR FERMI PH		
M1.1.1	WP1	Review of spallation targets	1 Jun 12	31 Aug 12	31 Aug 12	Stephen Brooks		SNS BR FERMI PH		
M1.1.2	WP1	Review of other neutron production targets	1 Jun 12	31 Oct 12	21 Sep 12	Stephen Brooks				
M1.2	WP1	Requirements for example future high power neutron projects, e.g. neutron spallation, ADS, irradiation, etc	1 Jun 12	31 Mar 13						
M1.3	WP1	Candidate target materials	1 Jun 12	31 Mar 13		Rob Edgecock				
M1.3.1	WP1	Materials already in use or under study	1 Jun 12	15 Dec 12		Stephen Brooks+Chris Densham				
M1.3.2	WP1	Possible new materials	1 Jun 12	31 Jan 13		Chris Densham		OXFORD SR?		

M1.3.3	WP1	Selection of materials for further study	1 Jun 12	31 Mar 13		Chris Densham		OXFORD SR?		
M1.4	WP1	Limits of targets vs requirements	1 Jun 12	31 Mar 15						
M1.4.1	WP1	Maximum operating temperatures and cooling rates	1 Jun 12	30 Nov 13		Tristan Davenne +RHPTG TS1+TS2				
M1.4.2	WP1	Existing data on tensile strength as a function of temperature	1 Jun 12	15 Dec 13		Roger Bennett				
M1.4.3	WP1	Measurement of tensile strength for candidates using RAL test rig	1 Jun 12	31 Oct 14		Roger Bennett		OXFORD SR?		
M1.4.4	WP1	Study of erosion/corrosion rates of target and target cladding materials.	1 Jun 12	31 Jan 14						
M1.4.5	WP1	Study/development of novel target condition monitoring systems.	1 Jun 12	31 Jan 16		Roger Bennett				
M1.5	WP1	Assessment of lifetime due to radiation	1 Jun 12	31 Aug 14						
M1.5.1	WP1	Study of existing radiation damage measurements and limits	1 Jun 12	31 Mar 14						
M1.5.2	WP1	Identification of materials for which further radiation damage studies are necessary	1 Jun 12	31 Aug 14						

M1.6	WP1	Radiation damage studies at an existing facility	1 Jun 12	31 Mar 16		Roger Bennett		SCK-CEN IU?		
M1.7	WP1	Neutron capture and delivery	1 Jun 12	31 Mar 16						
M1.7.1	WP1	Review of existing and planned systems	1 Jun 12	31 Aug 13		Rob Edgecock				
M1.7.2	WP1	Identify possible improvements for new systems	1 Jun 12	31 Jan 16						
M1.8	WP1	Shielding, remote handling, disposal, etc, aspects of targets, to be reviewed throughout studies	1 Jun 12	31 Mar 16		ISIS Target Design Group				
M2.1	WP2	Study of TS1 to 0.5 MW	1 Jun 12	30 Sep 13		Tristan Davenne + RHPTG				
M2.1.1	WP2	Model of energy deposition in target	1 Jun 12	15 Dec 12		Tristan Davenne + RHPTG				
M2.1.2	WP2	Temperature rise and thermal stress in existing TS1 vs measurements	1 Jun 12	28 Feb 13		Tristan Davenne + RHPTG				
M2.1.3	WP2	Temperature rise and thermal stress at 0.5 MW	1 Jun 12	30 Apr 13		Tristan Davenne + RHPTG				
M2.1.4	WP2	Mitigation of effects, if required and possible	1 Jun 12	30 Sep						

				13						
M2.2	WP2	Study of ISIS upgrade to 1 MW	1 Jun 12	15 Dec 14						
M2.2.1	WP2	Heat load, thermal stress and activation at 1MW with ISIS parameters	1 Jun 12	31 Oct 13						
M2.2.2	WP2	Candidate targets using information from WP1	1 Jun 12	31 Jan 14						
M2.2.3	WP2	Moderation system, etc	1 Jun 12	30 Apr 14						
M2.2.4	WP2	Shielding, cooling, remote handling, etc, requirements	1 Jun 12	31 Mar 14						
M2.2.5	WP2	Outline design for 1 MW	1 Jun 12	15 Dec 14						
M2.3	WP2	Study of 5MW target	1 Jun 12	31 Mar 16						
M2.3.1	WP2	Candidate target and moderation systems	1 Jun 12	30 Apr 14						
M2.3.2	WP2	Heat load, thermal stress, activation, etc studies with ISIS parameters	1 Jun 12	31 Jan 15						
M2.3.3	WP2	Selection of candidate target, moderator, etc	1 Jun 12	31 Aug 15						

M2.3.4	WP2	Shielding, cooling, remote handling, etc, requirements	1 Jun 12	31 Jan 16						
M2.3.5	WP2	Expected performance	1 Jun 12	31 Mar 16						
M2.4	WP2	Identification of contributions to ESS target and moderator	1 Jun 12	15 Dec 12						
M2.5	WP2	Completion of contributions to ESS	1 Jun 12	31 Mar 16						
M2.6	WP2	Upgrading the TS1 Target/Reflector/Moderator system	1 Jun 12	31 Dec 12						
M2.6.1	WP2	Baseline Model for TS1	1 Jun 12	30 Sep 12						
M2.6.2	WP2	Optimised Design for Current Power	1 Jun 12	30 Nov 12						
M2.6.3	WP2	Optimised Design for upgrade	1 Jun 12	31 Dec 12						
M3.1	WP3	Flow rig development for tungsten powder	1 Jun 12	15 Dec 13						
M3.1.1	WP3	Flow optimisation to achieve solid dense phase flow	1 Jun 12	31 Oct 12						
M3.1.2	WP3	Gas lift and recirculation	1 Jun	28						

		optimisation	12	Feb 13						
M3.1.3	WP3	Development of diagnostics	1 Jun 12	31 Jul 13						
M3.1.4	WP3	Upgrade to CW operation	1 Jun 12	15 Dec 13						
M3.2	WP3	Rig tests with tungsten	1 Jun 12	30 Nov 14						
M3.2.1	WP3	Continuation of current tests, e.g. density measurements	1 Jun 12	31 Aug 13						
M3.2.2	WP3	Erosion tests	1 Jun 12	30 Jun 14						
M3.2.3	WP3	Heating and cooling tests	1 Jun 12	31 Aug 14						
M3.3	WP3	Beam tests	1 Jun 12	31 Mar 16						
M3.3.1	WP3	Study use of LDV	1 Jun 12	31 Aug 12						
M3.3.2	WP3	Measurement and effect of stress waves at HiRadMat	1 Jun	15 Dec 12						
M3.3.3	WP3	Study of magnetic field effects at HiRadMat	1 Jun 12	31 Aug 15						

M3.4	WP3	Identification and test of low Z powder	1 Jun 12	31 Oct 15						
M3.4.1	WP3	Modifications to rig	1 Jun 12	30 Nov 14						
M3.4.2	WP3	Flow measurements, including density	1 Jun 12	31 Mar 15						
M3.4.3	WP3	Heating and cooling tests	1 Jun 12	31 May 15						
M3.4.4	WP3	Erosion tests	1 Jun 12	31 Oct 15						
M3.4.5	WP3	Beam tests at HiRadMat	1 Jun 12	31 Aug 15						
M3.5	WP3	Outline target station design	1 Jun 12	31 Mar 16						
M3.5.1	WP3	Outline circuit design, including active powder handling issues	1 Jun 12	31 Oct 15						
M3.5.2	WP3	Outline target station design for a candidate target	1 Jun 12	31 Mar 16						

Notes

DESCRIPTION OF COLUMNS

Target date = Planned date, expected completion date

Actual date = Date milestone is actually achieved

Status = Commentary on progress, update

Changes to the dates should be shown in bold