Milestone Table

Overall Milestone List										
Milestone No.	Work Package	Milestone Description	Baseline Date	Target Date	Actual Completion Date	Status	Delay due to		Affects Critical Path?	See Note
							UK?	Other Collaborators?		
M1.1	WP1	Review of existing and proposed targets for high power neutron production	1 Jun 12	31 Oct 12						
M1.1.1	WP1	Review of spallation targets	1 Jun 12	31 Aug 12						
M1.1.2	WP1	Review of other neutron production targets	1 Jun 12	31 Oct 12						
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						
M1.3.1	WP1	Materials already in use or under study	1 Jun 12	15 Dec 12						
M1.3.2	WP1	Possible new materials	1 Jun 12	31 Jan 13						
M1.3.3	WP1	Selection of materials for further study	1 Jun 12	31 Mar 13						

M1.4	WP1	Limits of targets vs requirements	1 Jun 12	31Mar 15						
M1.4.1	WP1	Maximum operating temperatures and cooling rates	1 Jun 12	30 Nov 13						
M1.4.2	WP1	Existing data on tensile strength as a function of temperature	1 Jun 12	15 Dec 13						
M1.4.3	WP1	Measurement of tensile strength for candidates using RAL test rig	1 Jun 12	31 Oct 14						
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						
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						
M1.7	WP1	Neutron capture and	1 Jun 12	31						

		delivery		Mar 16						
M1.7.1	WP1	Review of existing and planned systems	1 Jun 12	31 Aug 13						
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						
M2.1	WP2	Study of TS1 to 0.5 MW	1 Jun 12	30 Sep 13						
M2.1.1	WP2	Model of energy deposition in target	1 Jun 12	15 Dec 12						
M2.1.2	WP2	Temperature rise and thermal stress in existing TS1 vs measurements	1 Jun 12	28 Feb 13						
M2.1.3	WP2	Temperature rise and thermal stress at 0.5 MW	1 Jun 12	30 Apr 13						
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	1 Jun 12	31 Oct						

		and activation at 1MW with ISIS parameters		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	1 Jun 12	15 Dec						

		and moderator		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 optimisation	1 Jun 12	28 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