WPTE programme for the Campaigns in 2026:
Overview of research topics and categories of required competencies

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Introduction

This Annex presents the scientific programme of WPTE in 2026 including running experimental campaigns on four devices (AUG, TCV, MAST-U and WEST) as well as performing analysis and modelling for the 2026 and previous campaigns on them. In addition, proposals for data analysis and modelling activities for past JET campaigns including DTE2 and DTE3 can be made together with contributions for specific JET data validation tasks. Finally, the call covers participation to the analysis of the integrated commissioning IC1 and OP1 campaigns previously carried out in JT-60SA, as well as modelling for preparing future campaigns and the transition to tungsten of JT-60SA. This Annex should be used as a reference to answer the present Call for Participation.

For the experimental campaigns to be run on AUG, MAST-U, TCV and WEST in 2026, the WPTE scientific programme is divided into 9 Research Topics (RT), keeping the same structure as in 2025.

For each Research Topic, you will find listed in this Annex:

- The related Mission of the EUROfusion roadmap
- The reference WPTE Task Force Leaders (TFLs)
- The Research Topic Coordinators (RTCs) in charge
- The associated scientific objectives to be addressed
- An **indicative** number of pulses for each RT. Note that these numbers are subject to updates following the General Planning Meeting (scheduled for November 4-6, 2025). In addition, the overall discharge allocation might be reviewed as campaign progresses to cope with possible machine availability as well as urgent changes in scientific priorities.

The two JET specific RTs, introduced in 2024 after finishing the last experimental campaigns on the device, will continue and will be coordinated by the WPTE TFLs similarly to the previous years:

- RT-10: JET data validation
- RT-11: JET data analysis and modelling from C45 backwards

The Topical Groups (TG) for the work on JT-60SA, established for JT-60SA in the framework of the JA-EU Experimental Team, as well as an additional item dealing with IMAS activities will be the following:

- TG-ORD: Operation Regime Development
- TG-MHD: MHD Stability and Control
- TG-TC: Transport and Confinement
- TG-EP: High Energy Particle Behaviour
- TG-PED: Pedestal and Edge Physics
- TG-DSP: Divertor, Scrape-off Layer and Plasma-Material Interaction
- IMAS: Integrated Data Validation and Data Access with IMAS

An overview of the different topics for the 2026 WPTE programme can be found in Table 1, together with the corresponding IMS tag. You will also find in Table 2 the 4 categories of competencies to be used in IMS (IMS tag), to indicate whether your expertise lies in diagnostic operation (DO), data analysis and interpretation (DAI), modelling (MOD), data validation for JET (VAL) or in other areas (OTH).

You will find detailed instructions on how to answer the present Call for Participation under IMS in **Annex 3**. From the scientific side, the proponents should provide a work plan for each Research Topic / WPTE device they would like to contribute to.

Please note that the **work plan** you provide is the **main element** for WPTE to assess your participation. It should be complete though concise (typically ~2-3 sentences for each Research Topic / device where you would like to contribute). It should mention which physics issues will be addressed, in relation to the scientific objectives of the RT listed in this annex.

Therefore, we kindly ask the proponents to carefully read the description of the Research Topics in this Annex and to refer to it when elaborating their work plan. Indications on the quality level expected for the work plans are given in Annex 3.

Concerning the scientific priorities of the RT, you will find additional information in the slides that will be presented at the WPTE General Planning Meeting in 4-6 November, 2025. Those slides will be posted on the WPTE wiki in the meetings section.

Please note that contributions addressing issues raised by the recently accepted ITER baseline are encouraged and that this should be indicated in your work plan when applicable. You can use as a reference the documents put online for the Call for Proposals. Contributions extrapolating findings from present WPTE devices to next step fusion devices, such as ITER, are also encouraged.

If you have any further questions about a particular Research Topic, please contact the reference TFLs and the Research Topic Coordinators.

List of Research Topics and IMS tags

The ***IMS tag*** (4th column) refers to “step 2: select campaign/experiments” in the guidelines to reply to the Call in IMS (Annex 3).

	Research topic	Title	IMS tag
Mission 1	RT-01	Core-Edge-SOL integrated H-mode scenario compatible with exhaust constraints in support of ITER	RT01
	RT-02	Physics understanding of alternatives to Type-I ELM regime	RT02
	RT-03	Strategies for disruption and run-away mitigation	RT03
	RT-04	Physics-based machine generic systems for an integrated control of plasma discharge	RT04
	RT-08	Physics and operational basis for high beta long pulse scenarios	RT08
	RT-09	Physics understanding of energetics particles confinement and their interplay with thermal plasma	RT09
Mission 2	RT-05	Physics of divertor detachment and its control for ITER, DEMO and HELIAS operation	RT05
	RT-06	Preparation of efficient Plasma Facing Components (PFC) operation for ITER, DEMO and HELIAS	RT06
	RT-07	Physics understanding of alternative divertor configurations as risk mitigation for DEMO	RT07
JET specific	RT-10	JET data validation	RT10
	RT-11	Analysis and modelling of JET campaigns before 2023	RT11
JT-60SA specific	TG-ORD	Operation Regime Development	RT12
	TG- MHD	MHD Stability and Control	RT13
	TG-TC	Transport and Confinement	RT14
	TG-EP	High Energy Particle Behaviour	RT15
	TG-PED	Pedestal and Edge Physics	RT16
	TG-DSP	Divertor, Scrape-Off Layer & Plasma-Material Interaction	RT17
	IMAS	Integrated Data Validation and data access with IMAS	RT18

Table 1: List of topics for the 2026 WP TE scientific programme. The Missions 1 and 2 refer to the missions of the EUROfusion Roadmap.

List of competencies and IMS tags

Type of expertise	IMS Tag
Diagnostic operation	DO
Data analysis and interpretation	DAI
Modelling expertise	MOD
JET Data Validation	VAL
Other	OTH

Table 2: List of competencies to be used as tags under IMS.

Categories of competencies for IMS

Please use the competencies listed in Table 2 to describe your work plan in IMS, in terms of diagnostic operation, data analysis and interpretation, modelling, JET data validation or other activity.

Diagnostic operation

Please note that WPTE will support work for diagnostics or sub systems operation only for the systems which are not included in the operational costs of the contributing devices. If you plan to operate or support the operation of a diagnostic that is not included in this category but will be useful to a Research Topic, please state your expertise in your work plan, providing details on what your work will include. Please contact the WPTE TFLs if you are uncertain that the diagnostic support you propose is eligible for funding.

Data analysis and interpretation

Please describe in your work plan the data analysis and interpretation that you can perform for the specific Research Topic and Scientific Objectives, as listed in this Annex. You should identify the diagnostic data you will contribute to analyse (e.g. spectroscopic measurements), the type of analysis and interpretation you will contribute to (e.g. addressing pedestal physics).

Modelling Expertise

Please describe your expertise and include in your work plan the type of modelling you can perform for the specific Research Topic and Scientific Objectives, mentioning also the modelling codes that you will use.

JET data validation Expertise

Please describe your expertise and include in your work plan the type of data validation you would perform for JET within the selected diagnostics (see list in RT-10 descriptions) .

Other

You can use this category if none of the above applies to your work plan or if you are a pre-selected RTC.

RT-01: Core-Edge-SOL integrated H-mode scenario compatible with exhaust constraints in support of ITER

Mission: M1.1
TFLs: N. Vianello, B. Labit
Coordinators: M. Cavedon, C. Giroud, L. Frassinetti, S. Wiesen

Scientific objectives

#	
D1	Develop and understand stationary H-mode scenario at low collisionality and with dominant electron heating
D2	Provide physics-based cross-field transport coefficients for heat, fuel particles and impurities to TSVVs for turbulence modelling
D3	Determine the impact of different impurity mixes for partially detached divertors in high power operations in view of ITER radiative scenarios
D4	Assess pedestal performances in conditions closer to future devices including large SOL opacity, low pedestal collisionality, and peeling limited plasma
D5	Quantify pedestal transport and screening of impurities in conditions relevant for next-step fusion devices

Number of discharges Indicative number of pulses per device and RT, subject to revision following WPTE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	24	70	16	15

Competences

A non-exhaustive list of requested competencies is given hereafter.

Data analysis and Interpretation

MHD spectrum and mode structure; Kinetic profiles pedestal and SOL (ne, Te, Ti), Pellet injection/ablation; Bolometer/AXUV; IR thermography; Active and Passive spectroscopy; Light and Heavy impurity transport and concentration; Visible and Multiwavelength Cameras, Real time control (development, analysis,…); Fluctuation diagnostics (PCI, (C)ECE, DBS, Correlation reflectometry, Li-Be, He-Beams, LP at wall and divertor); SOL neutral density and ionization rates (MANTIS for TCV, HSV for MAST-U,…); BES and SPR for ne and ne fluctuations,…

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS, CASTOR, CASTOR-NN,…); SOL fluid (SOLPS, SOLEDGE2D, EMC3,SOLEDGE3X, SOLPS extended grid, SOLPS-ITER-NN,…); SOL turbulence (GBS, TOKAM3X, HESEL, GRILLIX, HERMES, INDICA,…); Core GK analysis (GENE, GS2, GKW, Qualikiz,…); Pedestal GK analysis (GENE, GS2, GKW,…); Nonlinear MHD (JOREK, NIMROD, MEGA,…); Interpretative (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, JETTO, Coconut,…); Material migration (ERO2.0, Walldyn,…); PIC SOL and core codes (BIT1, SPICE, EPOCH, …); Momentum transport modelling & analysis.

RT-02: Physics understanding of alternatives to Type-I ELM regime

Mission: M1.1
TFLs: B. Labit, D. Keeling
Coordinators: M. Faitsch, O. Sauter, E. Viezzer

Scientific objectives

#	
D1	Quantify turbulent and MHD driven transport in the vicinity of the separatrix and implications for predictions for ITER and DEMO
D2	Quantify first wall loads in no-ELM scenarios and provide a model for SOL transport extrapolation
D3	Extend the parameters space of no-ELM scenarios to large P_{sep}/R and/or pedestal top collisionalities relevant for ITER and DEMO
D4	Determine the key physics mechanisms regulating edge transport in order to access no-ELM regimes
D5	Quantify the level of ELM mitigation with 3D fields in low torque plasmas and its impact on W transport
D6	Quantify the overall performance, primarily improved confinement, of negative triangularity plasmas in view of next step fusion devices

The 2025 scientific Objective D5 - Determine access window and physics understanding for RMP ELM suppression and its compatibility with ITER FPO scenarios - has been reformulated as follows: *Quantify the level of ELM mitigation with 3D fields in low torque plasmas and its impact on W transport* refocusing therefore the specific R&D request from ITER.

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 04-06, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	30	80	32	0

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; RMP coils; CXRS; Bolometer/AXUV; (C)ECE ; IR thermography; Reflectometry; Fast-ions (FILD, FIDA,,..); Passive spectroscopy; Gas puff imaging; Langmuir probes; Reciprocating probe (midplane, X-point, RDPA…); Visible fast imaging; ECE imaging; Beam emission spectroscopy (BES); Tangential phase contrast imaging; Real time control (development, analysis,..); Lithium beam; HXR/ SXR (including GEM); Doppler reflectometry: DOPL, RIC/RFL,PREF, DBS,…; Thermal Helium Beam (THB).

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS...); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,LIUQE...); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA...); SOL fluid (SOLPS, SOLEDGE2D, EMC3,...); SOL turbulence (GBS, TOKAM3X, HESEL, GRILLIX ...); Core GK analysis (GENE, GS2, GKW,...); Pedestal GK analysis (GENE, GS2, GKW,...); Nonlinear MHD (JOREK, NIMROD, MEGA,...); Interpretative and predictive modelling (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, ...); MHD: plasma response to RMP (GPEC, MARS-F, VMEC,..., Material migration (ERO2.0, Walldyn,...); Impurity transport (ASTRA, TRANSP, STRAHL, AURORA, FACIT,...);...

RT-03: Strategies for disruption and run-away mitigation

Mission: M1.1
TFLs: V. Igochine, A. Hakola
Coordinators: U. Sheikh, C. Reux, O. Ficker

Scientific objectives

#	
D8	Develop an understanding of pellet assimilation for plasma densification in shattered pellet injection (SPI) experiments to avoid runaway electron (RE) generation
D9	Develop an understanding of SPI dynamics in off-normal plasmas, such as close to density limit and/or during impurity accumulation
D10	Determine the physics mechanisms leading to benign termination of RE with H and D, specifically in the ITER relevant parameter range.
D11	Determine the physics mechanisms generating run-away electrons in the current quench, including during a vertical displacement event (VDE), and in the plasma start-up phase, including electron cyclotron (EC) pre-ionization and EC-assisted burn-through
D12	Perform interpretative modelling of disruption mitigation dynamics, specifically aiming at physics understandings of experimental measurements to extrapolate models to ITER (in collaboration with TSVV-F).
D13	Characterise disruption loads, in particular during VDEs, to improve predictions for ITER
D14	Investigate the role of plasma phenomena (turbulence, MHD, waves, fast ions etc) on the transport and confinement of REs

Recent SPI experimental results from JET and AUG have expanded our understanding of the impact of various parameters on efficient SPI injection, further motivating a reformulation of the Scientific Objectives. The modifications have been introduced to account for the work performed in previous years including inputs received from ITER DMS Task Force. The proper correspondence between the new (D8-D14) and the original 2025 (D1-D7) objectives, including the attribution of SSRL starting level are available at https://wiki.euro-fusion.org/wiki/WPTE_wikipages:_Call_for_proposals_2026:_RT03, together with a further clarification of the work expected within the newly formulated Scientific Objectives.

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	30	85	0	45

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; Bolometer/AXUV; (C)ECE; IR thermography; Synchrotron radiation analysis; Passive spectroscopy; VUV spectroscopy; Fast (visible) camera analysis; ECE imaging; MSE; Li and He-beams; HXR/SXR (including GEM); MANTIS/MWI filtered imaging analysis; Fast Interferometry; Impurity spectroscopy analysis (main chamber, divertor,...); Bremsstrahlung; Thomson scattering; RF Antenna; RE energy spectra from gamma rays/HXR; REIS (synchrotron spectrum) analysis; Equilibrium reconstruction

Modelling

Nonlinear MHD (JOREK, NIMROD, MEGA, ...); RE impact (ERO, MEMOS, GEANT4, ...); RE modelling (LUKE, GO, STREAM, DREAM, SOFT, KPRAD, R5X2, SOFT....)

RT-04: Physics-based machine generic systems for an integrated control of plasma discharge

Mission: M1.1, M1.3, M2.1
TFLs: TFL TBD, V. Igochine
Coordinators: A. Mele, G. Derks, L. Piron, C. Vincent

Scientific objectives

#	
D6	Develop generalized controllers and state observers designed for application to a variety of devices
D7	Develop integrated control algorithms and techniques for pulse trajectory optimization in view of possible applications to next step device controllers
D8	Optimize off normal events handling and disruption avoidance strategies for machine protection
D9	Integrate machine learning and physics driven techniques for control augmentation and performance boosting

Given the progress achieved and the breadth of tools successfully developed in recent campaigns, scientific objectives have been revised to reflect a hierarchical view of the functionalities expected from a modern tokamak discharge control system. This updated structure is intended to support the systematic integration of individual controllers into a machine-agnostic Plasma Control System. The proper correspondence between the new (D6-D9) and original (D1-D6) objectives, including the attribution of SSRL starting level are clarified on the WPTE wiki page

https://wiki.eurofusion.org/wiki/WPTE_wikipages:_Call_for_proposals_2026:_RT04, together with a further clarification of the work expected within the newly formulated Scientific Objectives.

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	15	60	16	30

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; RMP coils; CXRS; IR thermography; Visible fast imaging; Beam emission spectroscopy (BES); Real time control (development, analysis,..); HXR/ SXR (including GEM); Doppler reflectometry: DOPL, RIC/RFL,PREF, DBS,...; MANTIS/MWI filtered imaging analysis; Impurities spectroscopy analysis (W, divertor...)/DSS; Pellet injection/ablation, Bolometer/AXUV, ECE, LP, Reciprocating Probe, Kinetic Profiles, Impurity spectroscopy analysis

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS...); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,....); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA...); ECRH/ECCD/Current drive (PION, TORAY, TORBEAM, CQL3D, C3PO, LUKE, NUBEAM, RABBIT, ASCOT, LOCUST, EPOCH,...); Interpretative (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, ...); Breakdown, burnthrough, ECWC (TOMATOR-1D, BKD0, GRAY, RAPTOR, EPOCH, ...); RE modelling (LUKE, GO....); MHD (N)TM dynamics (NTMwf,...); Machine Learning, Plasma transients analysis

RT-05: Physics of divertor detachment and its control for ITER, DEMO and HELIAS operation

Mission: M2.1
TFLs: N. Vianello, E. Tsitrone
Coordinators: P. David, S. Henderson, H. Reimerdes, N. Rivals

Scientific objectives

#	
D1	Characterize detachment access and core plasma performance in scenarios using different fuelling schemes, different impurity mixtures
D2	Develop reduced physics models which can be included in radiative detachment control schemes or extrapolations to DEMO/ITER
D3	Quantify edge-SOL particle, impurity, and heat transport, above and below the X-point under detached conditions
D4	Assess the compatibility and stability in terms of overall confinement of X-point radiator regimes
D5	Quantify the degree of ELM heat load mitigation achievable by impurity seeding, investigating the dependences on relevant machine parameters
D6	Assess the evolution of detachment under slow transients (L-H transitions, sawtooth, loss of impurity seeding)

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	24	70	24	30

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; Pellet injection/ablation; CXRS; Bolometer/AXUV; IR thermography; Passive spectroscopy; Gas puff imaging; Langmuir probes; Reciprocating probe (midplane, X-point, RDPA...); Visible fast imaging; Helium beam; Real time control (development, analysis,..); VUV spectroscopy; Lithium beam; MANTIS/MWI filtered imaging analysis; Impurities spectroscopy analysis (W, divertor...)/DSS; Edge Transport & ELM (buffering) analysis; Neutral Pressure analysis

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS...); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,....); SOL fluid (SOLPS, SOLEDGE2D, EMC3,...); SOL turbulence (GBS, TOKAM3X, HESEL, GRILLIX ...); Interpretative (IMEP, JINTRAC, ETS, ...); ICRF coupling (EVE-AQL, PION, TORIC-SSFPQL, ...); LH coupling; Impurity transport (STRAHL,...); Plasma transients analysis

RT-06: Preparation of efficient Plasma Facing Components (PFC) operation for ITER, DEMO and HELIAS

Mission: M2.2
TFLs: E. Tsitrone, A. Hakola
Coordinators: Y. Corre, A. Kirschner, K. Krieger

Scientific objectives

#	
D1	Quantify local power load distributions on castellated and shaped PFCs for ITER and DEMO, including melting events
D2	Assess the impact of sustained high power / high particle fluence plasma exposure on the thermo-mechanical properties of metallic PFCs as well as on plasma operation
D3	Quantify material erosion sources from metallic walls under ITER relevant plasma conditions and determine material migration pathways, in particular to assess W sources from the first wall and the net erosion rates.
D4	Quantify fuel retention in devices with metallic walls, with a focus on long pulse operation, including the impact of boronisations and using laser-based diagnostics where available
D5	Assess fuel-removal efficiency in metallic devices, including the impact of boronisations and propose fuel removal procedures for next step metallic devices
D7	Assess the efficiency and lifetime of wall conditioning methods in metallic devices, with a focus on boronisation

Note that the previous D3 and D6 scientific objectives dealing with material migration in 2024 have been merged into D3 for 2025, and that an additional scientific objective D7 related to boronisation has been added.

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	24	0	0	150

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

CXRS; LID-QMS; Bolometer/AXUV; IR thermography; Passive spectroscopy; VUV spectroscopy; Langmuir probes; Manipulator data (divertor, midplane, X-point,...); Reciprocating probes (midplane, X-point,...); Visible fast imaging; Real time control; Barometry and Optical Penning; Residual gas analysis (RGA); NPA; Li-Beam; HXR/SXR; Impurity spectroscopy; Calorimetry; Fast Interferometry; Analysis for high-fluence scenario development (MHD stability, ECRH/ECCD, LH coupling)

Modelling

Field line tracing (PFCflux, SMARDA, SMITTER); SOL fluid/kinetic (SOLPS, SOLEDGE2D, EMC3,…); Melting PFC (MEMENTO, …); RE modelling (GEANT4,…); Material migration (ERO, ERO2.0, Walldyn …); PIC SOL and core codes (BIT1, SPICE, EPOCH …); GDC boronisation and ICWC/ECWC modelling (TOMATOR,..); ICRH W source modelling (SSWICH, Petra-M, STRIPE, TOPICA, RAPLICASOL,…); Fuel retention modelling (MHIMS,…)

RT-07: Physics understanding of alternative divertor configurations as risk mitigation for DEMO

Mission: M2.3
TFLs: A. Hakola, B. Labit
Coordinators: O. Pan, K. Verhaegh, O Février

Scientific objectives

#	
D1	Determine the characteristics for plasma exhaust and scenario control as well as core compatibility in H-mode for different alternative divertor configurations (ADCs)
D2	Characterize possible benefits of snowflake and other ADCs with multiple X-point configurations for their X-point radiation stability and dissipated power in H-mode
D3	Quantify the degree of heat load mitigation during ELMs and other transients, achieved by impurity seeding, and investigate their dependences on relevant machine parameters
D4	Evaluate existing reduced SOL models against ADCs and validate core-edge, SOL and divertor models of increasing complexity against experimental data, for divertor optimisation as well as plasma exhaust understanding and control

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	45	100	48	15

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

Bolometer/AXUV/RADCAM; IR thermography; Passive spectroscopy; Gas puff imaging; Langmuir probes; Reciprocating probes (midplane, X-point, RDPA…); Visible fast imaging; Real time control; Coherence imaging; MANTIS/MWI filtered imaging analysis; Impurity and hydrogen spectroscopy analysis (main chamber, divertor,…); Divertor Thomson; IRVB analysis; Integrated Data Analysis (IDA); Equilibrium design (FIESTA modelling); Edge fluctuation and E_r measurements (helium beam, helium spectroscopy, Doppler backscattering); CXRS; Heat flux analyses using surface thermocouples; Transient analyses

Modelling

SOL fluid/kinetic (SOLPS, SOLEDGE2D, EMC3,…); SOL turbulence (GBS, TOKAM3X, HESEL, GRILLIX …); Interpretative (IMEP, ETS, ASTRA, RAPTOR, METIS, TRANSP, …); DIV1D/SD1D/SPLEND1D

RT-08: Physics and operational basis for high beta long pulse scenarios

Mission: M1.3
TFLs: TFL TBD, V. Igochine
Coordinators: S. Blackmore, F. Auriemma, C. Piron

Scientific objectives

#	
D1	Consolidate understanding of flux pumping mechanism and extrapolate to ITER/DEMO/JT60
D2	Quantify compatibility of high β_N long-pulse with mitigated ELMs and/or with exhaust in metallic wall devices in view of extrapolating scenario to JT-60SA W-wall operation
D3	Characterize the fast and thermal ion transport together with the ExB, magnetic shear, and turbulence conditions in steady-state scenarios at high-q
D4	Validate state of the art models for scenario extrapolation towards future devices
D5	Develop intrinsically steady-state solutions at high β_N (>3) in terms of q/pressure profile with mild MHD activity. Investigate the dependence of the scenario to the available actuators, and compare it to the expected JT-60SA and DEMO scenarios particularly in terms of extending operational space toward high Greenwald fractions
D6	Develop steady-state scenarios in metallic devices at high β_N in conditions of MHD characteristics close or above the no-wall ideal limit. Investigate the dependence of the scenario to the actuators and characteristics expected to be used in JT-60SA

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	32	70	24	15

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; CXRS; (C)ECE ; Reflectometry; Fast-ions (FILD, FIDA,...); Beam emission spectroscopy (BES); MSE; Lithium beam; HXR/ SXR (including GEM); Doppler reflectometry: DOPL, RIC/RFL,PREF, DBS, Bolometry, SAMI, Fast Ion Diagnostic (FIDA)

Modelling

Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,....); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA...); SOL fluid (SOLPS, SOLEDGE2D, EMC3,...): Core GK (GENE, GS2, GKW,...); ECRH/ECCD/Current drive (PION, TORAY, TORBEAM, CQL3D, C3PO, LUKE, NUBEAM, RABBIT, ASCOT, LOCUST, EPOCH,...); Interpretative (IMEP, ETS, ASTRA, RAPTOR, METIS, TRANSP, JETTO, JINTRAC...); ICRF coupling (EVE-AQL, PION, TORIC-SSFPQL, ...); LH coupling; W sources and transport (SOLPS, SOLEDGE-ERO ...), Reduced transport model (TGLF/MMM)

RT-09: Physics understanding of energetics particles confinement and their interplay with thermal plasma

Mission: M1.2
TFLs: D. Keeling, TFL TBD
Coordinators: J. Galdon, Y. Kazakov, A. Jansen van Vuuren, R. Ochoukov

Scientific objectives

#	
D1	Provide high quality demonstration of diagnostic techniques for the characterization of confined and lost fast ions with fast ion characteristics relevant for ITER and JT60-SA, qualify further diagnostic techniques required for deployment on JT-60SA
D2	Quantify ion and electron heating and core-turbulence stabilisation by fast ions in view of JT-60SA, ITER and DEMO including tailored FI energy profiles and radial locations relevant to JT-60SA
D3	Quantify the impact of fast ions and fast ion driven MHD instabilities on transport in various scenarios including those relevant to JT-60SA
D4	Integrate the available heating, fast-ion and transport modelling tools for interpretation of experimental results in view of extrapolation of results to ITER and DEMO
D5	Quantify fast-ion losses and associated heat load from edge perturbations (ELMs and RMPs)
D7	Identification of AE control actuators and assessment for ITER and JT-60SA relevant scenarios

The previous 2025 D6 is now considered to be absorbed into D4 as a subject for analysis of existing data or parasitic analysis of 2026 experiments.

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 4-6, 2025.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2026	16	50	16	0

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; RMP coils; CXRS; (C)ECE; IR thermography; Reflectometry ; Fast-ions (FILD, FIDA,,..); Poloidal correlation reflectometry; Proton detector; TAE antenna measurements ; Faraday cups; Gamma-ray spectroscopy, Fluctuation diagnostic (BES, TPCI...),ECCD/ECRH, MSE, HXR/SXR, Gamma ray spectroscopy, Faraday cups, TAE antenna, Ion concentration, Neutron detector, NPA

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS…); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,….); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA…); Core GK (GENE, GS2, GKW,…); Nonlinear MHD (JOREK, NIMROD, MEGA,…); Interpretative (IMEP, ETS, ASTRA, RAPTOR, METIS, TRANSP, …); MHD: plasma response to RMP (GPEC, MARS-F, VMEC,…); Fast ion orbits, resonances, distribution function (ASCOT, NUBEAM, EBdyna,…); Synthetic Fast ions diagnostics (FIDASIM, FILDSIM, GENESIS, …); fast-ion phase-space tomography

RT-10: JET Data Validation

TFLs: D. Keeling

Scientific objectives

#	
D1	Provide high quality validated data from JET experiments

Please indicate the time you would like to provide for JET data validation for the diagnostics listed below (corresponding to the JET Reqco list). The detailed list of competences requested is indicated in the table below. Additionally for 2026, WPTE will consider supporting training for data validation in the highly scarce areas of KS5 (CXRS/CHEAP) and KT3 (divertor spectroscopy) processes. Please indicate in your workplan if you wish to undertake such training and subsequent contribution to data validation.

Process	Sub-process
Bolometry	Tomography reconstruction
	Divertor
CXRS	Edge CX
	Main CX
	Impurity Ion Temperature (KS5)
	CHEAP Ion Densities (KS5)
Divertor IR	All KL cameras
	KL11 tomography
ECE	KK3
Interferometry	KG1 – All (LidAll, Lid3, Lid4), KG1V
KY6	Slow
	Fast
KT3	All (KT3a, b, c …)
EFIT	Fast
	Constrained
HRTS	“standard”
	LTT
Langmuir	KY4D
Reflectometer	KG10
Neutron spectroscopy	All (All KMnn, KN3N, TIN)
Gamma ray	(KM6, KN3G)
Toroidal Alfvén Eigenmodes	KC1T
JINTRAC	Integrated transport modelling
TRANSP	Interpretative transport modelling

Table 3 : list of JET diagnostic eligible for data validation under RT10

RT-11: Analysis and modelling of JET data before 2023

TFLs: D. Keeling, TFL TBD

Scientific objectives

#	
D1	Complete analysis of parameter dependence of separatrix properties to support extrapolation to ITER operational scenarios
D2	Complete analysis of experiments utilising novel ICRH schemes relevant to ITER and extrapolation to ITER operational scenarios
D3	Complete analysis of experiments that provide specific information on isotopic effects relevant to ITER and extrapolate to ITER operational scenarios
D4	Complete analysis of L-H transition studies and databases including divertor configurations. Extrapolate results to ITER operational scenarios

The analysis of specific JET datasets from experiments not covered under other Research Topics (RTs) is to be proposed under RT-11. For 2026, the scope of RT-11 has been refined compared to previous calls to focus on a subset of previously addressed topics, selected based on resource availability and their strategic relevance to ITER.

TG-ORD (RT-12): Operation Regime Development (JT-60SA)

Mission: M1.1
TFLs: J. Garcia
Scientific Coordinators: L. Garzotti

Scientific objectives

#	
D1	Safe increase of toroidal current up to 5.5MA in L mode
D2	Test of plasma control schemes: current, position, density, heating
D3	Break down and plasma formation studies in conditions of low loop voltage
D4	Initial integrated scenarios development towards ITER-standard H-mode scenario.
D5	Initial development of high beta integrated scenarios
D6	Integration of advanced real time control techniques, e.g. beta or ELMs control, in scenario development
D7	Characterize, by means of integrated modelling, scenario compatible with W as PFC in conditions of full machine availability

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data analysis and Interpretation

Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling

Interpretative (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, JETTO, Coconut, …); Integrated modelling (JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, JETTO…), Free boundary equilibrium codes (METIS-FEEQS, CREATE-NL,SPIDER…), Breakdown codes (BKD0,…), Heating codes (GRAY, ASCOT, SPOT,…), Real time control codes (RAPTOR…), Equilibrium Codes (HELENA, CHEASE…)

TG-MHD (RT-13): MHD Stability and Control (JT-60SA)

Mission: M1.1
TFLs: J. Garcia
Scientific Coordinators: G. Pucella

Scientific objectives

#	
D1	Disruption and runaway electrons studies
D2	Creation of disruption databases
D3	Sawtooth activity and modification by ECH
D4	Tearing Modes during ramp-up, flat-top, and ramp-down phases
D5	Neoclassical tearing mode stabilization with ECH/ECCD
D6	Neoclassical tearing mode control with ECCD
D7	Resistive wall mode studies
D8	Characterization of MHD activity in high beta plasmas
D9	Error field measurement, characterization and impact on locked mode

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data analysis and Interpretation

Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling

Linear MHD (MISHKA, CASTOR, MARG2D, MINERVA…) Nonlinear MHD (JOREK, NIMROD, MEGA, XTOR…); Resistive Wall Modes (CARMA, STARWALL, RWMaC,…)

TG-TC (RT-14): Transport and Confinement (JT-60SA)

Mission: M1.1
TFLs: J. Garcia
Scientific Coordinators: L. Garzotti

Scientific objectives

#	
D1	Heat transport in electron heated dominated plasmas in L-mode, H-mode and/or low β
D2	Characterization of L-mode confinement
D3	Initial characterization of H-mode confinement
D4	Isotope studies by comparison of H and D plasmas
D5	Heat, particle and impurity transport in high β plasmas
D6	Characterization of H-mode confinement in type-I ELMs plasmas
D7	H/D ratio control by gas-puff and pellet
D8	Characterise potential core and pedestal W screening
D9	Perform fully integrated core+edge+SOL simulations capturing the impact of W PFC on core confinement.

The previous objective D5 is merged with D1 since it also dealt with heat transport (in H-mode). Now all heat-transport investigations are under the same D1

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data analysis and Interpretation
Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling
Integrated modelling (JINTRAC, ETS, ASTRA, …), GK codes (GENE, GS2, GKW, GYSELA, …); Quasilinear codes (Qualikiz, TGLF, EDWM, …), Phenomelogical codes (CDBM, Bohm-GyroBohm, …)

TG-EP (RT-15): High Energy Particle Behaviour (JT-60SA)

Mission: M1.1
TFLs: J. Garcia
Scientific Coordinators: Y. Kazakov

Scientific objectives

#	
D1	Shine-through studies in H and D, especially with N-NBI
D2	Initial studies of fishbone and Alfvén modes destabilization by N-NBI
D3	Characterization of fast ions losses
D4	Neutron emission studies and reproducibility with codes
D5	Studies of Alfvén modes destabilization by N-NBI in high beta plasmas and impact on fast ion confinement
D6	Characterization of fast ions loses at high N-NBI power with FILD
D7	Interplay between fast ions and turbulence. Transport reduction by fast ions
D8	Compatibility of RMP with fast ion confinement
D9	Initial studies of alpha particle behavior in D-3He plasmas

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data analysis and Interpretation

Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling

Core GK analysis (LIGKA, GENE, GS2, GKW, ORB5, …); MHD interaction with Fast Ions (JOREK,CASTOR-K, MEGA, …); Fast ions slow-down characteristics (ASCOT, SPOT, …)

TG-PED (RT-16): Pedestal and Edge Physics (JT-60SA)

Mission: M2.1
TFLs: J. Garcia
Scientific Coordinators: Y. Liang

Scientific objectives

#	
D1	L-H power threshold characterization in H and D
D2	Pedestal and ELMs generation studies in different plasma conditions
D3	Characterization of the access to type-I ELMs and comparison to plasmas with no/small ELMs
D4	ELMs control with RMP and pacing pellets
D5	Investigate potential W screening capabilities of predicted pedestal for JT-60SA foreseen scenario at full machine capacity

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data analysis and Interpretation
Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling
Pedestal stability (EPED, EUROPED, ELITE, MARS, ...); Pedestal GKanalysis (GENE, GS2, GKW, ...); Nonlinear MHD (JOREK, NIMROD, MEGA,...); 3D linear/nonlinear MHD equilibrium (VMEC, HINT, ...); 3D nonlinear MHD analysis (MIPS...); Magnetic perturbation/spectrum analysis (ERGO...); full diffusive field-line diffusion code (FDFLD) ...

TG-DSP (RT-17): Divertor, Scrape Off Layer and Plasma-Material Interaction

Mission: M2.1
TFLs: J. Garcia
Scientific Coordinators: G. Falchetto

Scientific objectives

#	
D1	SOL width scaling at high I_p
D2	Wall conditioning
D3	Neutral compression by the V-shaped corner, He pumping
D4	Initial seeding studies and impact on the heat flux to divertor
D5	Determine the compatibility of the expected heat flux in foreseen JT-60SA at full machine capabilities with W PFC components, including the use of seeded impurities for heat flux mitigation
D6	Investigate divertor W erosion in different scenarios including the potential role of extrinsic seeded impurities for heat flux mitigation and characterise potential SOL W screening

Competences

A non-exhaustive list of requested competencies is given hereafter.

Data analysis and Interpretation
Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling
SOL fluid (SOLPS, SOLEDGE2D, EMC3, Coconut, ...); SOL turbulence (GBS, TOKAM3X, HESEL, ...); Material migration (ERO2.0, Walldyn, ...); PIC SOL and core codes (BIT1, SPICE, EPOCH, ...)

IMAS (RT-18): Integrated data validation and data access with IMAS

Mission: M2.1
TFLs: J. Garcia
Scientific Coordinators: F. Imbeaux

Scientific objectives

#	
D1	Integrated data validation
D2	Data access with IMAS

Competences

A non-exhaustive list of requested competencies is given hereafter.

Data analysis and Interpretation
Magnetic sensors, CO_2 laser interferometer (tangential), Visible TV cameras, Fast camera EDICAM, Divertor Langmuir probes and thermocouples, Soft X-ray detector intensity, Visible spectrometer (tangential), Quadrupole Mass Spectrometer, Magnetic (flux loops, magnetic probes, Rogowski coils, diamagnetic loops, AT probes)

Modelling
Integrated data validation (IDAV); IMAS