NINETEENTH FUSION ENERGY CONFERENCE

SESSION CT

Wednesday, 16 October 2002, at 16:10

Chair: N. UCKAN (USA)

SESSION CT: ITER

Paper IAEA-CN94/CT-1 (presented by M. Huguet)

Discussion

G.H. Neilson: In the leader–follower procurement strategy for ITER TF coils, how is it decided which supplier is the leader and which the follower? And, is it realistic to expect technical collaboration between industrial suppliers who are competitors on the world market?

M. Huguet: The objective of the leader–follower procurement scheme is to minimize the work duplication that is inevitable when the production is shared between two suppliers. It is envisioned that following the tender action, negotiations will take place between the ITER organization and the two successful bidders. These negotiations should result in an agreement on how to share technical responsibilities and the establishment of a detailed plan of collaborative activities and technology sharing.

R.J. Goldston: If you solve your problem by adding more strand, what is the implication for the cost?

M. Huguet: In order to restore the operation margin of the Nb_3Sn conductors, a range of options are being evaluated. These options include increasing the amount of superconducting material in the cable, increasing the critical current density of the superconducting strand or changing the conductor jacket material. The choice will be made based on technical and cost considerations.

G.S. Lee: In the proposed schedule chart, the fabrication period for the prototype winding pack is overlapping with that for the production pack. What is the main purpose of prototype fabrication, and how can there be feedback of results to the main coils?

M. Huguet: The detailed time schedule shows that each major manufacturing phase for the production coils starts only after the corresponding phase for the prototype has been completed and evaluated. So there is no overlap between prototype and production coils.

Paper IAEA-CN94/CT-2 (presented by M. Shimada)

Discussion

J. Ongena: Can you comment on the use of impurity seeding to alleviate the problems with ELM power exhaust? Impurity seeding can help to (substantially) reduce the inter-ELM losses (and surface temperature), thus allowing larger ELM temperature excursions before reaching the material ablation limit (as shown on JET).

M. Shimada: As you indicate, impurity injection offers a potential method for extending the target lifetime. Argon injection did not change the fraction of the target heat load to the energy loss from the core plasma during ELMs in JET (Rapp, J., et al., EX/P1-09), nor is this expected in ITER (Loarte, A., et al., ITERP/11(R) in the FEC 2000 proceedings). However, impurity injection certainly reduces the inter-ELM heat load, and it could help increase the edge collisionality while maintaining or improving the core confinement with reduced pedestal energy, which would reduce the ELM heat load. Furthermore, it could also change the type of ELM to type II, as was observed in JT-60 (Kubo et al., Phys. Plasmas **9** (2002)).

Paper IAEA-CN94/CT-3 (presented by T.H. Osborne)

Discussion

Y.K.M. Peng: Why is the pedestal width normalized by minor radius in the search for scaling dependences?

T.H. Osborne: Explicit size dependence was allowed in the empirical fits. In the physics based models both axes were normalized in the plots.

Paper IAEA-CN94/CT-5 (presented by A. Costley)

Discussion

R. Kaita: Are provisions for remote handling part of ITER diagnostic design requirements?

A. Costley: Yes. The details depend on the location of the diagnostic components. Diagnostic components mounted in the vacuum vessel are capable of being installed and maintained using the in-vessel remote handling equipment. Diagnostic components in ports are installed in modular sections in the port plugs. When repairs or changes are necessary, the port plugs will be transported in casks to the hot cell where they will be handled with remote handling equipment.

S.A. Sabbagh: Have basic diagnostics for resistive wall mode diagnosis (plasma toroidal rotation, locked mode detector) been included in the present plan?

A. Costley: Yes. ITER will be equipped with an extensive magnetics diagnostic system which includes pick-up coils and saddle loops mounted inside the vacuum vessel. These will enable measurements of resistive wall modes to be made. Information on MHD modes will also be obtained from ECE measurements and reflectometry. A dedicated reflectometer (Doppler reflectometer) for toroidal rotation measurements is also under consideration.