

Types of Questions Likely to Arise at the DOE/NSF LHC Software & Computing Review

1) Management

- Are the current management structures and techniques well-matched to the needs of the U.S. collaboration?
- Are their internal contingency and risk-management mechanisms appropriate?
- Are there adequate plans for transitioning from a development phase to a deployment and operations phase? Are the assumptions of resource requirements well justified?
- Are the priorities of the S&C program conducive to effective participation in data analysis by U.S. physicists?
- Does management have adequate S&C plans to accommodate new collaborators? Have they developed a reasonable model for the corresponding incremental costs?
- In terms of deliverables and physics analysis productivity, what are the impacts of a 10% S&C funding shortfall?
- Do the U.S. projects have adequate interactions with the international S&C efforts?
- Does the U.S. have an adequate S&C leadership role in the international collaboration? Is it commensurate with U.S. participation in the experiment?

2) Facilities, Grids, Networking, and Infrastructure

- Assess the progress and plans for deployment of the U.S. Tier-1 centers, the U.S. Tier-2 centers, and their integration with the CERN Tier-0 center.
- Are the experiments' computing models appropriate for U.S. needs?
- Have infrastructure and operating costs of the Tier-1 and Tier-2 facilities been fully considered in their plans? Are there any high-risk assumptions? Are the estimated personnel requirements, equipment costs, and infrastructure costs valid and well-justified?
- Evaluate, from a user's perspective, the usability and readiness of grid-based production and analysis software.
- Are cybersecurity issues given adequate priority by the project? On matters of security, are the lines of authority clear? Has the collaboration adequately assessed the impacts of a cybersecurity incident on user access to data and computing cycles? Is there a mitigation plan in place?
- Have network bandwidth and connectivity requirements been appropriately identified by the U.S. collaborations? Are these requirements consistent with their latest computing models? Is there a roadmap to achieve the required T0-T1-T2 connectivity?

- Do the U.S. projects have adequate links with the Worldwide LHC Computing Grid (WLCG) and the Open Science Grid (OSG)?

3) Software and Analysis Support

- Assess the effectiveness of the physics analysis and support models and whether they are responsive to the needs of the U.S. community. Are there adequate metrics to monitor progress in this area? Have all required resources been identified by the collaborations? Will the models support U.S. researchers at their expected physical location during the various phases of the experiment?
- Evaluate, from a user's perspective, the usability and readiness of analysis software.
- Are the manpower requirements for the maintenance and operation phase of production software well understood and justified? On what basis are commitments made to the international collaboration? Are these commitments realistic and consistent with U.S. interests?
- Is the role of Tier-3 centers well-defined and integrated in the S&C facilities plan? Are the plans for Tier-3 facilities sufficient to enable physics analysis at U.S. institutions?
- Evaluate the progress in core software with respect to the milestones shown at the previous comprehensive DOE/NSF review of the U.S. program in February 2006. Are U.S. milestones on track and realistic? Is there any critical dependence on international milestones that brings substantial risk to U.S. deliverables?
- Is the U.S. core software portfolio balanced so as to give U.S. researchers a realistic chance for effective participation in the science of the LHC?