Review Committee Report
US ATLAS Analysis Support Model Review of January 4, 2007

The US ATLAS Research Program Managers initiated a review of the analysis support activities on January 4, 2007. The review agenda and slides from the talks may be viewed at http://indico.cern.ch/conferenceDisplay.py?confId=10284.

The Review Committee members participated in the review either in person, via ad hoc video conference, or by phone. The Committee members discussed their findings through email exchanges and phone conference calls during the week following the review. All members of the Committee agree with the findings in this Report.

This Report provides a review of the US ATLAS Analysis Support Model utilization by the collaboration during the time from March 2006 when the support structure was formally put in place, and the time of the review. It includes a description of the goals, the findings, and recommendations for (i) the Analysis Support Centers (ASCs), (ii) the Analysis Support Group (ASG), and (iii) the Analysis Forums (AFs) in US ATLAS. Additionally, there is a set of recommendations on what might be useful metrics to provide a measure of the analysis support structure effectiveness. Finally, a set of general comments includes additional observations and recommendations.

The Review Committee kept in mind that there are some analysis issues that are ATLAS wide and not just under the US purview: changing software releases in ATLAS (what works today may not work next week), data from a large complex detector that results in software that is complex and in some cases not so transparent. This report is restricted to be a review of only the US ATLAS analysis support effectiveness during the period of time given above.

Analysis Support Centers:

There are three regional Analysis Support Centers: one at Brookhaven National Laboratory (BNL), one at Argonne National Laboratory (ANL), and one at Lawrence Berkeley National Laboratory (LBNL). The geographical distribution facilitates access to the ASCs by collaborators in all parts of the US. Their function is to provide office and meeting space to collaborators, host US ATLAS and ATLAS personnel that can provide technical assistance to US ATLAS groups in performing their analysis, be a regional site for organization of seminars and training sessions for large groups of researchers, and serve as a home base for some members of the ASG. The ASCs should facilitate strong collaborations between the Tier 1 and Tier 2 computing centers and with various ATLAS physics and performance groups.

Findings:
There is an ASC Coordinator at each site: Ma at BNL, LeCompte at ANL, and Loken at LBNL. An Advisory Committee has been formed for each of the three ASCs which will write a yearly report on its activities. There have been six Analysis Jamborees held at the ASCs since they were formed in March 2006, three at BNL, two at ANL and one at LBNL. The web sites with information on each of these meetings may be found at

http://www.usatlas.bnl.gov/twiki/bin/view/AtlasSoftware/PastUSMeetings.html.

Each ASC's Jamboree has had a slightly different format in order to meet the needs of the community. A fair number of experts were present and a varying number of software tutorials were given at each meeting. A lot of work was done in small groups. In addition to the Jamborees, there have been several instances of smaller groups or even individuals using the ASC infrastructure and personnel expertise to assist them in performing analysis in ATLAS.

Up to now, a good deal of the time in these Jamborees has been devoted to introductory tutorials and instructions for beginners on how to set up the software and begin analysis. As anticipated, the ASCs Jamborees are moving away from a format aimed at beginners towards more advanced topics and activities, especially in preparation for the ATLAS CSC notes. We expect support at the introductory level will increasingly be provided locally at each institution. This dynamic evolution at the ASCs is encouraged.

There is unanimous agreement in the material presented to the Committee that the Analysis Jamborees have been successful and very well received by the collaboration. They are well staffed and suit the needs of the visitors. All surveys taken by the ASG Chair give very high marks for the Jamborees.

Recommendations:

1. The Review Committee as well as many in US ATLAS anticipates that the needs of the collaboration will change as we come to LHC turn-on. The ASCs should remain dynamic and responsive to the needs of the community. For example, there may be a need for longer term visits by students and postdocs at the ASCs.
2. The ASC Coordinators should take responsibility to ensure increased integration with the AFs and the ASG. ASG members should be encouraged to participate in all Jamborees and relevant AFs.

Analysis Support Group:

The ASG consists of a group of experts from throughout US ATLAS universities and laboratories. The ASG is meant to provide the required software and analysis support to the collaboration via regional interactions at the ASCs and by direct contacts via the web or email. The ASG is led by a Chairperson, Stephane Willocq.

Findings:
The ASG has been formed and is well staffed. The Review Committee is unanimously pleased and impressed with the performance of the ASG Chair (Willocq) in executing the Task Force recommendations. The ASG membership may be found at http://www.usatlas.bnl.gov/twiki/bin/view/AtlasSoftware/AnalysisSupport. There are clear examples where the community has made great use of ASG members at the ASCs and where ASG members have visited universities to provide one-on-one assistance in person to US ATLAS collaborators. However the Review Committee feels that in general the ASG has been underutilized by the full US collaboration. The community seems to be unaware of the ASG composition, in general. It appears that many physicists

in the collaboration do not understand the purpose of the ASG, to rapidly respond to users' software problems. As a result of the ASG underutilization, this great resource has not been used to assist US ATLAS in reaching its full potential. It is clear to the Review Committee that the ASG personnel are responsive to requests from the community in the cases where this took place; however the US ATLAS collaboration has not, in general, asked for ASG help in the way it was envisioned by the Task Force.

An additional concern for the Committee is the extent to which some ASG members, in cases where their expertise is being used, might get overburdened with support activities (emails, phone calls, visits from collaborators). The ASG members represent (by construction) some of the best experts in specific fields who should be able to devote time to continue to contribute to the overall progress of ATLAS. There should be a mechanism for ASG members to rotate off the group and be succeeded by well-trained newcomers.

Recommendations:

1. The ASG members need to be proactive in fulfilling their mission to assist US ATLAS members with analysis support.
2. The ASG Chair should ensure that the entire US ATLAS collaboration is made aware of this resource. The Committee is encouraged by the recent email from the ASG Chair to the entire collaboration informing them of this resource.
3. ASG members should make a greater effort to attend the ASC Analysis Jamborees and relevant AF meetings. This will help them to become better known to the community.
4. The ASG membership should be reviewed periodically to ensure that the top quality people in the collaboration are not so swamped with support activities that they cannot perform their own physics analysis.
5. Deploy HyperNews expeditiously. It will provide a searchable record of questions and answers, and it will enable more knowledgeable users to help answer questions, thus reducing the burden on this group.

Analysis Forums:

The physics analysis support structure, including the AFs, was meant to ensure good representation and promote visibility of US efforts and young physicists in ATLAS. The AFs were meant to be a vehicle for groups in the US with common physics interests to meet and discuss their analyses. The meetings should have a working character where people can present detailed aspects of their work and get feedback from experienced people.

Findings:
Information on earlier AF meetings may be found at http://www.usatlas.bnl.gov/twiki/bin/view/AtlasSoftware/PastUSMeetings.html and at http://indico.cern.ch/categoryDisplay.py?categId=296. There is substantial variation between the AFs in meeting frequency, attendance and impact on overall ATLAS. Some of the AFs have met relatively frequently (e.g. e/gamma) and the tools developed have

been presented in ATLAS meetings and propagated to the official software. At the other extreme, some forums have never been convened. The original need for the AFs, to serve as a discussion forum where work can be discussed at a much more detailed level than in the corresponding ATLAS physics or performance group, has to a large extent been fulfilled by the CSC working groups. The AFs could remain very useful however, depending on their usage and goals, and do have the advantage of holding meetings during the work day across North America. One approach could be to focus US efforts on specific topics, such that in overall ATLAS the US is recognized as having produced that result and as the center of expertise. As a possible example for illustration, in hadronic SUSY analyses, what generators are available for the enormous QCD backgrounds? What are their advantages and disadvantages? What are the big uncertainties (ISR, gluon pdfs ...) in the generators that early, relatively low luminosity data can address? What studies could help us plan for those analyses? A focused effort could yield a real statement on this topic rather than the loose studies occasionally seen in ATLAS so far. In every major analysis topic, there are such broad issues that can be presented and discussed, with subprojects spun off to someone new.

Recommendations:

1. The AF Conveners need to be proactive in getting US ATLAS collaborators engaged in these activities, not waiting to be contacted by collaborators who may not even know of the activity.
2. The needs within ATLAS will certainly change as the collaboration moves beyond the CSC note activity to LHC turn-on and beyond. The AF conveners need to be proactive in responding to these changing needs.
3. Meetings need to be convened on a regular basis, even if attendance is poor or spotty. Meetings need to take place at the Jamborees to give people an opportunity to meet face-to-face and become better known to the community, especially the students and new postdocs.

Metrics:

The Review Committee discussed possible means of developing metrics to evaluate the effectiveness of this analysis support model. While there was general agreement that this model is quite suited to the needs of US ATLAS if utilized properly, there was no obvious set of metrics in all cases. However, the Committee does offer the following suggestions.

1. Surveys of each Analysis Jamboree should be taken, as is being done already. There are quantitative measures of success at each ASC for every Jamboree that was made available to the Review Committee. In each case, the satisfaction with the Jamborees and the ASCs were very high.
2. Track the numbers of phone calls, emails, and personal visits by each ASG member per month.
3. The extent to which software developed in the US via this support structure gets adopted in ATLAS should be assessed.

4. Make a survey (through the IB) to evaluate how many institutions would like support but are not getting it, and why. This should include those who have not interacted with the support organization so far.

General comments:

The US ATLAS analysis support structure appears to be lean and efficient and complements efforts that already exist in ATLAS. Most of the ASC personnel and the ASG membership provide their services to the collaboration without compensation for their work. (Some ASG members are paid by Program funds to do other work, but also provide this service to the community.) The Review Committee is pleased to see that each ASC will add at least one-half of an FTE to support the analysis effort in the US over the next several months. The Review Committee only has anecdotal knowledge of the structures put in place in other large countries. It would probably be useful to make a more detailed assessment of those and their effectiveness as compared to the US ATLAS model.

By design, this analysis support structure is meant to be available to the US ATLAS users that want to take advantage of it, but is not meant to be imposed upon any individual or group in the collaboration. There are 400 people currently in US ATLAS (faculty, senior scientists, postdocs, graduate students; actual heads, not FTEs). It appears that in every case where this analysis support resource is used, the response by the collaboration has been very positive. The Review Committee did not get input from groups NOT using this resource to determine whether this is by choice or not. It is clear that the model is working and should not be abandoned. This analysis support structure has been in place for only 10 months so it is too early to assess its full effectiveness to the community. As more members learn of the full extent of this resource, the Review Committee anticipates that it will be more fully utilized.

The committee recommends continuation of the software distribution support to the Tier3 facilities located at the collaborating institutions. Such facilities may become important for quick turn-around debugging of the programs before submission for major data analyses, for the operations of the interactive graphic packages and for small, local projects involving undergraduate students using ATLAS software but without a need for GRID and security certificates.

The Committee has insufficient information to assess if US ATLAS members resident at CERN are receiving adequate analysis support, either from ATLAS or from US ATLAS. It would be useful to have a better understanding in this area.

The analysis support needs of the US ATLAS community will only grow over the next few months. There is the cosmic ray running period, followed by LHC turn-on, followed by the first physics run next year. The migration from the Tevatron and other experiments is in full swing. The ASG Chair and the ASG members, the AF conveners, and the ASC leadership must be proactive and anticipate these needs to ensure optimum US contributions to ATLAS. This model needs to remain dynamic in order to be effective.

Appendix 1: Review Committee Members

1. Keith Baker	Yale University
2. Gustaaf Brooijmans	Columbia University
3. Mel Shochet	University of Chicago
4. Ryszard Stroynowski	Southern Methodist University
5. Charles Young	Stanford Linear Accelerator Center

Appendix 2: Charge to the Review Committee

The U.S. Analysis Support activities have been launched. This has 3 main ingredients -

- the three Analysis Support Centers (ASCs)
- the Analysis Support Groups (ASG)
- the various analysis forums.

Details of the Analysis Support activities area can be found at:
http://www.usatlas.bnl.gov/twiki/bin/view/AtlasSoftware/AnalysisSupport.

We will have an informal mini-review of the U.S. Analysis Support activities to understand how well this effort is being carried out. Is our analysis support effective and responsive to the needs of U.S. physicists, both in U.S. and at CERN? Will there be adequate support during all phases of the experiment? Have the broad guidelines suggested in the task force report been followed? Is the organization, staffing and the activities at the support centers sufficient? Are the organization and the activities of the ASG and the analysis forums providing an appropriate and sufficient environment to promote U.S. Physicist involvement in LHC physics?

The review committee will identify the aspects of the analysis support activities that need further strengthening and provide new input based on the experience gathered in the past year. We also suggest that the committee carefully look at the metrics defined to measure success/progress and suggest additional metrics if necessary.