

Draft Minutes of the Phone Meeting of the Site Qualification Committee for US Barrel Module Production

Held on Friday 21st February 2003

Present: Bjarne Stugu (Scand)
Nobu Unno, Susumu Terada (Japan)
Tony Carter, Janet Carter (UK-B)

Apologies: Richard Brenner (Scand)

1. Introduction

The Committee had been asked to consider the report submitted by the US cluster (3rd US update, 12th February 2003) on modules P1 to P27 constructed (or started) in the US from series components. It was asked by the Project Leader to reach one of the following conclusions before March 3rd:

- (a) Recommend to accept the US proposal for altered specifications (not yet received)
- (b) Reach an agreement with the US cluster to invest more resources
- (c) Reach an agreement on an alternative proposal
- (d) Refer the matter to the PL and ATLAS review

The results in the report were discussed. The recommendations focussed on (c), with agreement reached between the representatives of the 3 Clusters. See section 3 below.

2. Assessment of US Modules

The modules from P8 onwards (newer production) were assessed against the agreed proposals for the US Cluster coming from the Barrel Module Working meeting on December 10th 2002. The proposals are reproduced below, followed by the assessment of the Committee (SQ):

For the US Cluster:

a) Module assembly progresses with series components, paying particular attention to achieving:

I. improved leakage current performance after bonding

SQ: A welcome improvement is seen in the data provided. However, the final result, following the necessary bonding rework, is the most important one (not yet available).

II. close checking for verification of no glue emerging from wafer edges or junctions, as the community agrees to allow this Cluster to use a modified glue pattern if this can continue to be shown to be successful in large scale production.

SQ: No information provided.

III. reducing damage, for example from surface scratches of wafers, during assembly

SQ: No information provided, but the leakage current values suggest that the wafers are undamaged.

IV. all mechanical tolerances being maintained within the BM specifications.

SQ: This is not met. Information was not provided on all mechanical parameters, but from that given, 9 out of 20 modules/4 wafer assemblies were out of specification. Of these the SQ judged that 4 were only slightly outside the specification boundary. Another 2 arose from operator error. Hence the committee is still hopeful that, with tightened procedures and more experience, the US cluster will be able to make modules within or very close to the mechanical specifications with high yield.

b) The stated aim of the Cluster is to move rapidly to assembly of two modules per day, as the initial target. This should allow completion of around 40 quality modules in 5 working weeks. It is suggested that after this number of completed modules there is a review by the committee to help the Cluster agree its future workplan and to assess yields and performance.

SQ: It is premature to hold this review, as only 18 modules (P1 to P18) have been reported as bonded.

Information considered in the review will include:

I. ability of jigging schemes and bonding quality to meet the necessary specifications

SQ: The production quality coming from the jigging schemes and checking and adjustment procedures still needs to be improved.

The bonding quality is not yet fully proven (the committee took note of the quality of the old fan-ins). We expect much less than 1% unbonded or partially bonded channels for nearly all modules, as achieved by all the 3 other clusters. We regard it as very important to minimise the number of bad channels in a module caused by assembly problems, given all the effort taken to provide essentially perfect detectors and ASICs with no bad channels. The NO and s-curves of the modules seem satisfactory.

II. consideration of the total time for assembly and QA, from start to final checked and approved module ie available for shipping to UK for mounting

III. with breakdown of times needed to carry out sub-items of this chain.

SQ: It is premature to consider II and III as a routine quality production procedure has not yet been established.

2. From the module assembly rates estimated by the Cluster it is expected that the review should be scheduled for mid-February 2003.

SQ: It is premature to consider the review. See the section 3.

3. Recommendations

- 3.1 The SQ Committee does not consider that the US Cluster has yet met the necessary standards to be qualified for full series production.
- 3.2 It requests that the existing modules be completed, including full bonding rework, and the results are presented in SCT week.
- 3.3 It recommends that new production be continued with full checking and adjustments as necessary, with the intention that specifications are routinely and consistently met.
- 3.4 There is concern that the limited number of series module components must not be wasted. In particular, the US cluster is asked to review and report its yield performance on a fortnightly basis, and also to put carefully on hold any 4 wafer assembly that is outside the agreed specifications, without mounting the hybrid.
- 3.5 The SQ Committee expects a further general review of quality to take place in 2 months time.
- 3.6 The Barrel Module Community will agree sensible acceptance tolerances just beyond the existing mechanical specifications to cover the tails of distributions. Beyond this, the SQ Committee, representing 3 clusters of the Barrel Module Community, does not wish to see any change in the agreed mechanical or electrical specifications.
- 3.7 The SQ Committee recognises that these recommendations will slow the rate of module production in the US over at least the next 2 months. It recommends that discussions take place between the Clusters during the next 2 weeks to finalise a plan for building some additional modules in Japan.
- 3.8 The committee unanimously agreed these recommendations.