# *SALT BEC Meeting #59*

**31 July 2015 via Skype**

# *SALT Edge Sensor (SAMS) Project*

**Chris Coetzee - Project Manager**

Supported by the SAMS Project Team:

Hitesh Gajjar (HG), Project Engineer; John Menzies (JWM), Analyst; Ockert Strydom, System Engineer; Keith Brown, Electronics Engineer; Deon Bester, Software Engineer; Jonathan Love, Mechanical Technician; Vic Moore, Project Procurement Officer

## 1. System Status and Developments

Further efforts to optimise both the software and the control algorithms have realised incremental improvements in the ability of the system to control the array. These improvements have, among others included:

a. Critical changes to the communication protocols to eliminate the intermittent instability issues
b. Changes to manner in which the matrix mathematics constrained the movement of the array as a body. These were necessary to compensate for the recently discovered inconsistencies in the truss behaviour which is not homogenous as originally specified and designs.

***A recent long duration tests has shown that, over a period of 7 nights and a temperature span of 9 ˚C, the SAMS system largely maintained the mirror shape to***

***specification over the period. This is a significant achievement and demonstration of the system's capability.***

## 2. Software Developments

Further software work is being carried out to improve the overall reliability and ability of the system to correctly handle the GROC control under all temperature gradients. This has meant the migration of GRoC control from the SAMS software to the MACS software which can more accurately (in time) implement GRoC corrections. The existing implementation in the SAMS software is prone to timing latencies which will be completely eliminated with the migration to MACS. This work is ongoing.

In addition to this, further commissioning of unique temperature compensation polynomials specific to each sensor is currently underway.

## 3. Production Developments

Further strides have been made towards the industrialisation of the bonding equipment required to bond the bushes to the segments (from which the L-brackets are suspended) and the equipment required to bond the flexible sensors to the L-brackets.

This industrialisation process is necessary to cope with the large numbers of bushes and sensors which require bonding for the entire array. This is especially necessary given the high number of sensors that require bonding over short time periods due to the compressed schedule (combining Phases 2 and 3). The bush bonding process is undergoing an ATP test to qualify both the production process and equipment. The more complex sensor bonding equipment has passed its conceptual design phase and a critical design review is imminent. A pre-production unit is also being manufactured to test the concept.

The schedule presented in Board meeting #37 remains unchanged with completion of the system by 31 March 2016 with April 2017 as a possible buffer. See detailed schedule attached as Appendix A

## 4. Manpower Issues

Dr John Menzies has accepted and signed his contract but Deon Bester did not accept his contract. He would sign a contract lasting the full financial 2015-16 year with an inflationary increase. This means that his contract will be worth R636,000.00. We offered him a contract for R300k. This new contract will ensure 2 things:

- He will be available full time to the SAMS team during the installation and testing of the array as it is being populated over time, as well as the final acceptance testing during January – March 2016
- He does not look for other full time employment and is lost to the project during these crucial activities

## 5. Project Costs

Project costs are reported in the CFO's report

## 6. RECOMMENDATIONS

6.1 The BEC approves the cost to completion for SAMS

## Appendix A: Schedule

| | | Task Name | % Complete | Duration | Start | Finish | Predecessor | Successor | Resource |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | + Completion of Phase 1 | 0% | 14 days? | 2015/02/16 | 2015/03/04 | | | |
| 6 | | + Commercial Preparation for Phases 2 and 3 | 0% | 19 days? | 2015/02/16 | 2015/03/11 | | | |
| 14 | | + Technical Preparation for Phases 2 and 3 | 13% | 97.94 days? | 2015/04/01 | 2015/07/31 | | | |
| 22 | | | | | | | | | |
| 23 | | + Button Manufacture and Bonding | 0% | 96 days? | 2015/05/18 | 2015/09/28 | | | |
| 46 | | | | | | | | | |
| 47 | | - Delivery and Testing of First 115 sensors + Test Rack | 0% | 160 days? | 2015/03/12 | 2015/10/21 | 9 | | |
| 48 | | Preparation of 35 sensors at FOGALE | 0% | 30 days | 2015/03/12 | 2015/04/22 | | | |
| 49 | | Delivery of 35 sensors | 0% | 1 day? | 2015/07/07 | 2015/07/07 | 50,51 | | |
| 50 | | Delivery of Test rack + modules + cables | 0% | 1 day? | 2015/07/08 | 2015/07/08 | 49 | 52 | |
| 51 | | Bond 35 sensor pairs rate at 5/day | 0% | 7 days | 2015/07/08 | 2015/07/16 | 49 | 52,54 | |
| 52 | | Characterise 35 sensor pairs (Cape Town) | 0% | 14 days | 2015/07/17 | 2015/08/05 | 51,50 | | |
| 53 | | Delivery of 20 sensor pairs | 0% | 10 days | 2015/08/17 | 2015/08/28 | 49 | 54,56 | |
| 54 | | Bond 20 sensor pairs rate at 5/day | 0% | 4 days | 2015/08/31 | 2015/09/03 | 53,51 | 57 | |
| 55 | | Characterise 20 sensor pairs | 0% | 4 days | 2015/07/17 | 2015/07/22 | 51 | 58 | |
| 56 | | Delivery of 20 sensor pairs | 0% | 10 days | 2015/08/31 | 2015/09/11 | 53 | 57,59 | |
| 57 | | Bond 20 sensor pairs rate at 5/day | 0% | 4 days | 2015/09/14 | 2015/09/17 | 56,54 | 58,60 | |
| 58 | | Characterise 20 sensor pairs | 0% | 4 days | 2015/09/18 | 2015/09/23 | 57,55 | 61 | |
| 59 | | Delivery of 20 sensor pairs | 0% | 10 days | 2015/09/14 | 2015/09/25 | 56 | 60,62 | |
| 60 | | Bond 20 sensor pairs rate at 5/day | 0% | 4 days | 2015/09/28 | 2015/10/01 | 59,57 | 61,63 | |
| 61 | | Characterise 20 sensor pairs | 0% | 4 days | 2015/10/02 | 2015/10/07 | 60,58 | 64 | |
| 62 | | Delivery of 20 sensor pairs | 0% | 10 days | 2015/09/28 | 2015/10/09 | 59 | 63,66 | |
| 63 | | Bond 20 sensor pairs rate at 5/day | 0% | 4 days | 2015/10/12 | 2015/10/15 | 62,60 | 64,68 | |
| 64 | | Characterise 20 sensor pairs | 0% | 4 days | 2015/10/16 | 2015/10/21 | 63,61 | | |
| 65 | | | | | | | | | |
| 66 | | - Manufacture of 341 sensor pairs (FOGALE) | 0% | 77 days | 2015/10/12 | 2016/01/26 | 62 | | |
| 67 | | Delivery of 341 sensor pairs | 0% | 7 days | 2015/10/12 | 2015/10/20 | 68 | | |
| 68 | | Bond 341 sensors at 5/day | 0% | 70 days | 2015/10/21 | 2016/01/26 | 67,63 | | |
| 69 | | Characterise 341 sensors (5 /day) | 0% | 70 days | 2015/10/21 | 2016/01/26 | | | |
| 70 | | | | | | | | | |
| 71 | | - Electronics + Cable Delivery and Installation | 0% | 185.94 days | 2015/05/15 | 2016/01/29 | 9 | 83 | |
| 72 | | Procurement of RACKS and cable components | 0% | 110 days | 2015/05/15 | 2015/10/15 | | 73 | |
| 73 | | Expedition of 1 rack, 12 P and 12 SC cables | 0% | 7 days | 2015/10/16 | 2015/10/26 | 72 | 74 | |
| 74 | | Expedition of 1 rack, 12 P and 12 SC cables | 0% | 7 days | 2015/10/27 | 2015/11/04 | 73 | 75 | |
| 75 | | Expedition of 2 racks, 2x12 P and 12 SC cables | 0% | 7 days | 2015/11/05 | 2015/11/13 | 74 | 76 | |
| 76 | | Expedition of 2 racks, 2x12 P and 12 SC cables | 0% | 7 days | 2015/11/16 | 2015/11/24 | 75 | 77 | |
| 77 | | Expedition of 2 racks, 2x12 P and 12 SC cables | 0% | 7 days | 2015/11/25 | 2015/12/03 | 76 | 78 | |
| 78 | | Expedition of 2 racks, 2x12 P and 12 SC cables | 0% | 7 days | 2015/12/04 | 2015/12/14 | 77 | 79 | |
| 79 | | Expedition of 2 racks, 2x12 P and 12 SC cables | 0% | 7 days | 2015/12/15 | 2015/12/23 | 78 | 80 | |
| 80 | | Expedition of 2 racks, 2x12 P and 12 SC cables | 0% | 7 days | 2015/12/24 | 2016/01/01 | 79 | | |
| 81 | | Installation of sensors, electronics and cables | 0% | 69.94 days | 2015/10/26 | 2016/01/29 | | 83 | |
| 82 | | | | | | | | | |
| 83 | | + 3 ring Array ATP | 0% | 60 days | 2016/02/04 | 2016/04/28 | 71,81 | | |