Progress on GTC Engineering Operations

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Scope

- Operations
  - Statistics

- Maintenance
  - Telescope
  - Instruments

- Projects & Activities
  - FASE II Program
  - CANARIAN financing
  - ICTS & MECON Program
Slight decrease in incidents, despite the subsequent shutdown and startup of the GTC due to the impact of COVID-19
Operations – Statistics #3

- **Technical losses**: Accumulated average (March 1st, 2020 – June 30th, 2020) 2.04%
- **Optical Quality of the Telescope**: Global Reflectivity (650nm – $M1 \cdot M2 \cdot M3$) > 62.0%
- **Replacing Primary Mirror Segments**: (Segments Changed Jan. 2020 – July 2020) 12 units

(18 in 2017)
(36 in 2018 !!!!)
(18 in 2019)
(12 in 2020)
OVERVIEW: This period is very marked by the turning off and starting up of the GTC due to the impact of the COVID-19. No notable incidents except for a faulty boggie (Obs. Shutters), and problems in M1, which were resolved.

Formal alarm status for COVID-19 in Spain (movement restrictions)

"Hibernation in Spain", only allowing essential work activity

Closure of "La Residencia" at the Roque de Los Muchachos Observatory. On March 30th we started the shutdown of the telescope and scientific instruments.

Opening of "La Residencia" (day 13), start up of the Telescope. Recovery of M1, OSIRIS and preparations to recover HORuS and EMIR. A broken Lower-Shutter boggie is detected and corrected.

First opening and technical observation: Primary Mirror Alignment

First night with Astronomer in remote control room. Bad weather and failure in Primary Mirror.

EMIR Cooling and Start-up. Recovery of HORuS on April 30

April 23rd: Scientific observations begin! Astronomer in remote control room (CALP) and Night Operator in GTC

Last M1 segment change (pre-COVID-19)

Last night of conventional observation

Preparations and major locksmithing and welding work for the installation of the Cassegrain set in the Telescope Tube

Strong position variation of 2 Cabinets of M1, M3, ICMs and other systems to make room for the Cassegrain rotator and the new Half Moon Platform.

First M1 segment change (post-COVID-19)

Problems in M1, after Cabinets position change

CanariCam Cooling and Start-up

Technical stop to make changes to M1. Some nights tests and science are performed. The problems on M1 are solved and this one strengthened.
OSIRIS: The instrument has behaved well.

- The instrument has performed well and smoothly in recent months. We had to heat and cool the cryostat after two weeks of shutdown, due to the impact of the Coronavirus, a maneuver performed without relevant technical problems.

- Possible IFU: We have collaborated with a team that wants to propose an IFU for this instrument, making measurements, etc.

CANARICAM: The instrument is operational at the FC-E focal station.

- After cooling and preparing it between January and March, the impact of COVID-19 prevented its use. It had to be heated and deactivated, and we have recently put it back into operation, after the restrictions on work by COVID-19 were reduced. Currently, the primary mirror has yet to be put into phase for scientific operation with it.

HORuS: Is operative. Software corrections / improvements

- ONGOING: It is operational, but tests (IAC) with the version of the software are in progress, due to problems recently encountered with the control system.
MEGARA: The observations are made regularly.

- **STATUS**: We still have some unresolved issues before the instrument is delivered, but we are already working with new contractors and our own staff to solve them. We are focusing efforts on recovering damaged positioners (we have outsourced this work) and on correcting electromechanical defects in the pseudo-slit. On the other hand, we’ve already changed several VPHs. **Robotic positioners**: Intervention with positioner manufacturer contractor scheduled for September: Recover non-functional spare parts and positioners in failure, in focal plane. The initial schedule was affected by COVID-19. **SDSU**: We have repaired and improved the cooling system of the SDSU (detector controller) where cooling water was leaking on it. We have also added additional temperature probes for this subsystem.

Instrument is operational, while we work hard to correct all problems.

EMIR: Good performance in the last months Future plans.

- **ONGOING**: There was a heavy maintenance of cold heads, in October. We were able to reduce the downtime, initially planned to last one month. The work scheduled for September 2019 on the Window, improvements to the PLC control and replacement of a critical pressure sensor was postponed and will be carried out next week (January 19, 2020). We also characterize the capacitances of the “piezos”.

- **FUTURE**: The disassembly of EMIR to correct the tilt of the detector and maintain the CSU was scheduled for end of 2020. There is now a delay due to COVID-19 and the completion of the work for Cassegrain and Half Moon Platform, and this major work cannot be done until the first half of 2021.
Projects and GOI Activities #1

PHASE II:

- **New UPS (Safe Electricity):** *On Going*, we should receive the UPS in week S43 (October, at the latest S44 -November-).

- **Helio Frida and Miradas:** *New tender* (negotiated and single-provider, in progress). We should receive the hoses in the week S39, to install them (after outbaking) in S43 (end of November).

- **Pendientes de MEGARA:** Date for positioner repair located in September 2020 (delayed by COVID. AVS –provider- closes in August) Advances in pseudoslit rec. (purchases made).

CANARIAN FINANCING:

- **SOLAR: Photovoltaic Energy Generation Plant in ORM:** Still with bureaucratic procedures but advancing. A meeting of the National Park panel was held, approving the project. On the other hand, we do not know yet that the Historical Heritage of the Town Hall has approved its part to Garafía City Council. Even so, some procedures have been approved, with the idea of starting the bidding process as soon as possible. The Town Council’s Environment Department, etc. have already issued favourable reports, and no environmental impact report is required.
Projects and GOI Activities #2

ICTS:

- **Hydrostatic System**: A purchase of spare parts is missing (in preparation) and a final report is under review.

- **M1**: Completing preparation for electronic tendering (ACPs) and advances in nodal box sensors.

- **ISS**: (Interlock & Safety System): Reduced activity, but previous meetings have been held. Starting soon.

- **Workshop and lab equipment**: On going.

MECON:

- **Scientific Archive and Backup**: A disk has already been bought due to urgency.

- **Network Security and Access Control**: Preparing proposal and purchases.

- **Upgrade Coating Chamber**: Initiating contacts with supplier for sizing the upgrade.

- **Air Compressors**: Tender for compressors ready.