	1984	85	86	87	88	89	90	91	92	93	94	95	96	1984–1996
La Silla	57	59	53	50	66	66	56	53	51	57	58	60	75	58.5
Paranal	80	82	80	77	81	78	71	71	69	79	81	83	81	77.9

Table 1: Yearly average percentage of photometric nights at ESO sites.

able limit for deciding of its relevance to astronomy.

In addition to the seasonal weather patterns affecting the Atacama desert[6], the analysis of the SOI-CCA dependency is further complicated by the presence of longer-term climatic fluctuations whose periods are counted in decades and which have no apparent phase relations with El Niño events. For instance La Silla, which has been following since 1992 a positive slope, is thus comparatively less affected by the current El Niño than it had been in 1991 when the effects were cumulative.

The SOI is not currently predictable but meteorologists are making progress in the understanding of atmosphere-ocean interaction. As far as ground-based astronomy is concerned, the assessment of atmospheric effects has also drastically improved in the past 10 years. Nevertheless, long-range forecasts will remain for some time limited to subjective analyses leading to cautious statements of the type: “Observing conditions will degrade at ESO observatories in 1998. However, if the current El Niño situation persists, conditions at La Silla will probably not reach historic lows of 1987 and 1992.”

[6]ESO Internal Workshop on Forecasting Observing Conditions, *The Messenger* 89, Sept. 1997, pp. 5–10.

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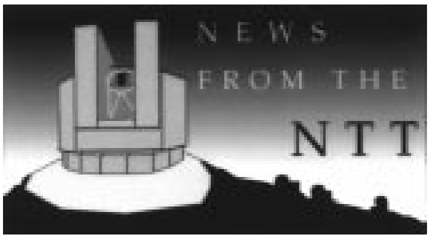

NEWS FROM THE NTT

G. MATHYS, ESO

The NTT has, at the time when this is written, been back into operations for 4 months. Emphasis during that period has been laid on stabilising the control system and developing an operational model. Accordingly, there has been virtually no technical intervention except for fixing problems or improving the robustness, in strong contrast with the upheaval of the Big-Bang year during which most of the control system had been replaced.

The Operational Model

Two modes of operations are currently supported at the NTT: service and classical.

Service observations are performed by the NTT support astronomers according to the schedule defined by the User Support Group (USG) of the Data Management Division (DMD). The latter is established according to the OPC recommendations and is supplied to the NTT Team under the form of Observation Blocks (OBs) which reside in a database.[1] The OBs, each of which fully describes an observation, have been defined generally well before they are scheduled by the PIs of the selected programmes, using the Phase 2 Proposal Preparation (P2PP) tool. The OBs are assembled into a schedule by the Observing Tool (OT), which is the interface between the database and the High-Level Observing Software (HOS) running on the acquisition workstation.

During the second half of Period 59 (that is, for observations to be performed until the beginning of October), PIs had to travel to the ESO headquarters in Garching to run P2PP to prepare their OBs. As of its version 1.0, released by the USG in September, P2PP has started to be distributed outside ESO, and applicants who have been allocated observations in service mode with the NTT now have the possibility to install this software on their own computers and to carry out the phase 2 preparation in their home institutes. This is done with the support of the USG, which answers questions and to which possible problem reports must be addressed.

Essentially the same scheme is followed for classical observations. Visiting astronomers are invited to come to La Silla two days before the beginning of their run, to prepare the bulk of their OBs on the La Silla off-line computing system before the start of their observations. This step is carried out with the help of the NTT support astronomers. P2PP is also run at the NTT during observation to perform last-minute modifications of the OBs.

Classical observers can, of course, also get the P2PP software from ESO and use it to prepare their OBs at home. However, ESO does not have the means to provide on-line support for that case, so that questions and problems that might arise at that stage will have to be solved upon arrival of the visiting astronomer on La Silla.

A calibration plan defined jointly by the USG and the NTT Team is executed by the latter on a daily basis, so as to guarantee that all the data that are taken can later be calibrated in a standard manner. The use of P2PP and the regular execution of the calibration plan guarantee that the data coming out of the NTT are suitable for archive research. As a matter of fact, all the data taken are systematically archived.

The archiving process is still very much in the same transitional status as reported in the previous issue of *The Messenger*, as far as the automatic archiving software is concerned. However, on the operational side, significant progress has been achieved on at least two aspects. One is the implementation of a (temporary) tool to transfer in real time the data obtained during service observing to an archive machine in the ESO Garching headquarters, in order to speed up delivery to the investigators by the USG. On the other hand, on-site production of the CD ROMs on which the data are eventually archived has begun on La Silla.

System Performance

Overall, the telescope and instruments have performed very smoothly since the return into operation. There has been only a very small number of failures of the new control system, and they could in general be fixed in a minimum time. Accordingly, the overall technical downtime has been low. However two problems of more importance were

[1]The concept of OB has already been described on various occasions in previous issues of *The Messenger* (see e.g. the NTT News in the last issue).

Table 1. NTT downtime during the second half of Period 59.

Observing mode	Weather downtime (%)	Technical downtime (%)	Effective technical downtime (%)
Classical	30.5	3.8	5.5
Service	29.6	1.9	2.7
Classical & Service	30.2	3.2	4.5
Technical time	58.9	—	—
Grand total	33.7	2.8	4.2

identified, which are not intrinsic to the VLT standard control system.

As a matter of fact, the very bad weather conditions that have prevailed on La Silla throughout the Chilean winter have, by far, been the main source of loss of observing time since the NTT has resumed operations. This is clearly seen in Table 1, which summarises the NTT downtime statistics for the second half of Period 59, that is, from June 27 to October 9. The repartition of the downtime between the various operational modes is given in that table, where the successive rows correspond respectively to the nights devoted to classical observing, to those dedicated to service observing, to the total of the former two (that is, to all the nights assigned to regular observations), to the scheduled technical nights (for which the notion of technical downtime is meaningless), and finally to the grand total of all the nights of the half period. These modes are identified in the first column of the table. The other columns give, in order, the percentage of the total nighttime lost due to bad weather, the fraction of the total nighttime lost for technical reasons, and the fraction of the time when weather was suitable for observations and when it was impossible to observe because of technical problems (i.e., the ratio of the technical downtime to the difference of the total nighttime and of the weather downtime).

In terms of the performance of the NTT, the most relevant entry in Table 1 is the effective percentage of technical downtime for the nights when regular observations were scheduled, once that the total nighttime available has been corrected for the 30.2% of time during which bad weather prevented observations from being executed. The good performance of the NTT during the first months of operations is reflected by the fairly low effective technical downtime of 4.5%.

A considerable fraction of the effective technical downtime can be assigned to one of the two main problems mentioned at the beginning of this section. This problem had already been anticipated in the NTT page of the previous issue of *The Messenger*: the CAMAC motor controller has been failing repeatedly, at a rate of 2–3 times per 24 hours. Let us recall that this is one of the few parts of the control system that has not been upgraded. Similar failures were already occurring before the Big Bang, but much more seldom; they appear to be due to an intrinsic flaw in the design of the controller. The problem has been tackled energetically during the first months of operations. The huge increase of the number of failures with respect to the old control system was found to be due to a difference in the way in which the controller is accessed. A workaround was found and implemented in the second half of September, which basically restores the pre-Big-Bang level of reliability of the element. Since these failures account for a large fraction of the Period 59 technical downtime, the latter is expected to be significantly lower during Period 60.

The other major problem that was identified is a quick degradation of the telescope pointing. While pointing models are built with a root-mean-square accuracy of about 1″, pointing errors of up to 15–20″ develop in timescales of days. This situation is probably not new: pre-Big-Bang measurements were already hinting at a similar effect. The impact is actually small for most observing programmes. But the problem has been emphasised by the unusually strict requirements set by the execution at the NTT of the ESO Imaging Survey, for which mosaic images are taken, which rely on the expected excellent pointing of the NTT. It is currently under investigation, and a preliminary analysis indicates that the origin is an undue mechanical motion. However, the faulty element remains to be identified.

Technical Developments

As mentioned in the beginning of this note, emphasis in the last 4 months has been laid upon system stability. Accordingly, technical developments have been kept to a minimum, and have mainly aimed at streamlining and improving the reliability of operations. Within that framework, an area of particular relevance has been the templates (used to drive the system through the HOS), whose functionality, efficiency, and reliability have been considerably enhanced. Other areas where important consolidation work has been conducted in the background include the autoguider and the active optics. The work done may often remain almost invisible to the users, but it proves essential for the long-term robustness and usability of the system.

A rare exception to this situation has been the installation in August of a new *in-situ* cleaning unit for the primary mirror. The interest of this modification had been perceived before the Big Bang in a study of the results of the mirror cleaning. It is too early to assess the progress achieved with the new unit.

The current frozen situation of the NTT will come to an end in December, when the installation of SOFI begins. This will mark the start of a new series of major upgrades, which will be described in future issues of *The Messenger*.

Personnel Movements

There have been two departures and two arrivals in the NTT Team since the writing of the NTT page for the previous issue of *The Messenger*.

In July, Joaquín Pérez has resigned from ESO for personal reasons after many years of excellent services. Joaquín has been employed in various functions within ESO, including those of telescope operator, responsible for the preparation of the photographic plates, and member of the optics group, before joining the NTT Team as daytime operator. In all of them, he has been very appreciated for his dedication, his care, and his kindness.

In July too, Blanca Camucet has joined the NTT Team as Data Handling Operator, a new function, which falls within the framework of the support of VLT Operations by the DMD. As a matter of fact, Blanca will be assigned to the NTT only temporarily, in preparation of her passage to the VLT, as soon as the latter starts to produce data. Her current work is part of the prototyping of the VLT operational model at the NTT. Blanca's responsibilities include the archival of the data (in particular the preparation of the CD ROMs) and the maintenance of the databases.

August saw the replacement of Pierre Martin by Jean-François Gonzalez in one of the positions of postdoctoral fellow in the NTT Team, and in the function of EMMI Instrument Scientist. Pierre had joined ESO and the team in the beginning of 1996. As responsible for the commissioning of EMMI, he has been instrumental to the success of the NTT Big Bang. The difficulty of the challenge that he had to face cannot be overstated, and he takes a large credit for the fact that

EMMI is now working smoothly and reliably. Through a well-deserved recognition of his merits, Pierre has now been hired as staff astronomer at the Canada-France-Hawaii Telescope.

I take advantage of this occasion to welcome the newcomers, and to wish success in their new activitities to those who have left us.

Erratum

In the NTT News page that has appeared in The Messenger No. 89, at the bottom of the rightmost column of page 12, reference has been made erroneously to Period 60, instead of Period 59. One should read: “. . . the already described delays . . . have prevented the NTT Team from executing many of the service observing programmes that had been approved by the OPC for the first half of Period 59 . . .”.

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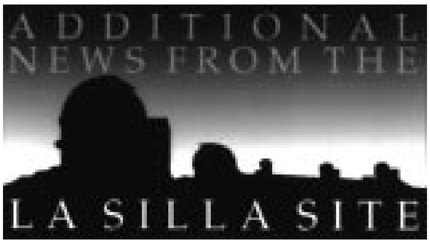

The La Silla News Page

The editors of the La Silla News Page would like to welcome readers of the eighth edition of a page devoted to reporting on technical updates and observational achievements at La Silla. We would like this page to inform the astronomical community of changes made to telescopes, instruments, operations, and of instrumental performances that cannot be reported conveniently elsewhere. Contributions and inquiries to this page from the community are most welcome.

(R. Gredel, C. Lidman)

SOFI – Current Status

C. LIDMAN

SOFI (Son of ISAAC) is the new IR imaging spectrograph on the NTT. It replaces both IRSPEC, which was decommissioned last year, and IRAC2b which will be decommissioned in 1998. SOFI recently underwent system tests in Garching. Both the spectroscopic and imaging modes were successfully tested. The efficiency of the instrument is almost double that of IRAC2b. The performance of the Rockwell HgCdTe 1024×1024 array and the IRACE controller is excellent. In non-destructive read-out, the read-out noise of the array is a few electrons. This is comparable to the read-out noise of optical CCDs. During November, the instrument will be shipped to Chile. It will be installed on the NTT during December, where it will undergo further system tests. The instrument will be commissioned during March next year and offered as an ESO common user instrument during Period 61.

Further details can be found at the NTT web page: http://www.ls.eso.org/lasilla/Telescopes/NEWNTT/NTT-MAIN.html

Image Quality of the 3.6-m Telescope (Part VI) Now Diffraction Limited at 10 Microns at the f/35 Focus

S. GUISARD, U. WEILENMANN, A. VAN DIJSSELDONK, H.U. KÄUFL, J. ROUCHER, ESO

The images at the f/35 Cassegrain focus of the 3.6-m telescope have never been excellent. As the system (c.f. [1]) was initially installed and used to do only aperture photometry, this was never an issue of major concern. In fact, it could not even be measured directly. Only with the advent of mid-infrared cameras (here TIMMI [2],[3]) the image quality could be measured easily and systematically. Several reports state that the average Image Quality (IQ) over the last years was of the order of 1.5″ FWHM with exceptionally some good images below 1.0″. These images were made with TIMMI at 10 microns, the only instrument and wavelength used presently at the f/35 focus. As a consequence of the less than perfect image quality, the Strehl ratio and hence the sensitivity for point sources was degraded, typically by a factor of two. The IQ was poor compared to the diffraction limit at 10 microns on this telescope (0.7″) and the average seeing at La Silla at the same wavelength (between 0.5″ and 0.7″). This comparison leads to the evidence that the “man-made” degradation of the image is important.

This article summarises investigations, corrective actions and the results finally obtained after several periods of technical time (Work Component