

A “User’s Guide” to the ORM Common Budget

Version 2.1, March 12, 2010. J. Andersen

Background

The basis for the definition and administration of the financial matters related to the operation of the Observatorio del Roque de los Muchachos (ORM) is the financial provisions of the international *Agreement on Cooperation in Astrophysics* and corresponding *Protocol*, which formally came into force in 1983. In particular,

- Article 9 of the Agreement specifies (1) that Spain is responsible for the initial investment in common infrastructure, e.g. roads, power, water, Residencia, etc., while (2) the cost of any further installations services needed by the *User Institutions* (UI) will be subject to negotiations between the funding agencies signing the Protocol, and (3) the maintenance and operating costs of ORM shall be apportioned as specified in the Protocol.
- Article 5 of the Protocol specifies that (1) the telescope installations and their maintenance cost are paid by the UIs; (2) the recurrent cost of common facilities shall be paid directly by the UIs according to their measured use of these facilities; (3) *undifferentiated costs* shall be shared among UIs in proportions defined by the CCI; and (4) a *Buffer Fund* would be provided by the UIs to enable the IAC to pay running expenses before invoicing the UIs for the refund.
- Article 6 of the Protocol makes the IAC responsible for providing appropriate common facilities and establishing the corresponding user fees, both in agreement with the CCI.

However, neither a precise distribution formula nor the procedures by which the CCI would define one is spelled out in these documents. Accordingly, practical procedures for the management of the budgets and accounts of the Common Budget have been developed over the years by the Finance Sub-Committee (FSC) of the CCI to achieve compatibility with the financial procedures of the UIs and the IAC. As these procedures may not be intuitively obvious to a newcomer, the following summary is intended to clarify a few key points.

Items included in the Common Budget

A basic principle for the attribution of costs at ORM is that consumables that are measurable and directly attributable to each UI (e.g. electricity, water, telephone bills) are invoiced and paid directly and do not figure in the Common Budget. The latter only contains the so-called *undifferentiated costs*, which cannot be apportioned to individual UIs (e.g. administration, communications infrastructure, safety and emergency services, etc.). Such costs are distributed among UIs in proportion to their estimated use of the common services.

Parameters used to distribute these common costs between UIs should be (i) reasonable; (ii) simple; and (iii) easy to measure. Moreover, they should allow for addition or upgrade of (new) facilities without dramatic financial impact on the other UIs. No single parameter is known that fulfils all these conditions; hence a combination of parameters is used. Currently they are:

1. The (sum of the) diameter of the telescope aperture(s);
2. The area covered by the buildings of each UI, in square meters; and
3. The average power consumption, measured as the average instantaneous power (in kVA) that corresponds to the measured total annual consumption (in kWh).

Each of these parameters is computed as a percentage of the total in its category. A straight mean of the three percentages for each UI is then the percentage share of that UI of the common budget.

These parameters had a simple interpretation as long as all the ORM telescopes were night-time instruments of conventional design and operation. Since then, solar telescopes have been added with small apertures relative to the level of activity of the UI, as well as radio or cosmic-ray telescopes with large apertures relative to their effective use of the common facilities. This is dealt with by using an “effective diameter” \emptyset_E in the formula instead of the nominal diameter, such that:

$$\emptyset_E = \emptyset_N \quad \text{for Night-time telescopes of diameter } \emptyset_N$$

$$\emptyset_E = 3.3 \emptyset_S \quad \text{for Solar telescopes of diameter } \emptyset_S$$

$$\emptyset_E = 0.2 \emptyset_C \quad \text{for Čerenkov telescopes of diameter } \emptyset_C$$

The actual parameters used and the resulting mean percentages are summarised in the distribution tables, which are updated annually as the observatory evolves.

Development and execution of the Common Budget

An *Expense Budget* for the next year is proposed annually by the ORM Site Manager, based on the result of the previous year, expected developments, and thorough discussions in the *Operations Sub-Committee* (OSC). The FSC reviews the resulting Expense Budget proposal, which is then approved by the CCI, based on the FSC recommendation. The FSC is also kept informed of other expenses incurred by the IAC as regards roads, other infrastructure, communications, etc.

The Income Budget is provided by: (i) the agreed annual payments by the UIs; (ii) direct payments by the users of the Residencia and other Common Services, at rates approved by the FSC and CCI; and (iii) income from other organisations or companies. Actual income is thus only predictable in part, as it depends on the level of occupancy of the Residencia during the year.

At the end of each year, the accounts document the actual expenses incurred, and the resulting surplus/deficit is forwarded to the budget of the following year.

As buildings and other infrastructure of the observatory age, an issue of deferred maintenance has arisen, and the ORM Site Manager and the OSC have prepared a *Long Term Plan* for the associated investments over the years 2009-2012, totalling some 500,000 €. Based on a survey of UIs by the FSC, the CCI decided in 2009 to cover the remaining sum in equal instalments over the years 2010-2012. Plans for further maintenance projects will be reviewed again in 2011.

The Residencia budget

The budget and accounting of the Residencia require separate explanation. All UIs have a need to maintain access to accommodation and meals at ORM, independent of fluctuating occupancy levels. The undifferentiated budget items are therefore divided in agreed proportions (from 0 to 100%) between the general services to the observatory and the Residencia, and the former are invoiced separately to the UIs each year.

This contribution is only a fraction (~40%) of the total costs of the Residencia plus the general services. The balance is contributed by payments at agreed rates for the Residencia rooms by the individual occupants – staff, visiting astronomers, contractors, or guests. Depending on actual occupancy during a year, the net result may be a surplus or a deficit. As the level of occupancy by individual UIs cannot be fixed in advance, the surplus or deficit is not balanced by refunds or additional payments on an annual basis, but accumulated separately by the IAC.

Annual results of the Residencia have fluctuated considerably over the years, but are predominantly negative. A *Buffer Fund* was initially used to cover the shortfall, but the IAC has absorbed the net accumulated deficit over the years. While it is not administratively feasible to cancel a deficit dating back many years, the aim is to set the room rates such that a balance is maintained over a few years on average, and this is being achieved. Meals are paid for directly to the catering company.