

Doc. Ref.	Issue	Date
<b>DNM/COO/NOM/SAF – SHP SG WA10/</b>	<b>0.1</b>	

## **SAFETY HUMAN PERFORMANCE SUB-GROUP**

### **WORKING AREA 10 SAFETY AND TEAM WORK FACTORS**

#### **TRM IMPLEMENTATION**

#### Introduction

The provision of safe, orderly and expeditious flow of air traffic is highly dependent on team work. Air Traffic Controllers are at the front (sharp) end of service provision and they are backed by a professional group of ATC/ATM experts and Engineering staff.

The ATCO team varies in size, either the single person operating alone or the more recommended two-person team of executive and planner. However, whether working alone or not, ATCOs are part of a watch/shift/team whatever the organisation calls it. In turn the watch is part of a larger team inside the Operations Room. The Teams grow larger and larger as more professions are included to ensure the appropriate quality of service.

EUROCONTROL's Safety Human Performance Sub-Group has identified Team Work Factors as one of the ten priority areas where more work needs to be done to ensure the current level of safety and improve on it. Teaming is also an essential pillar of Safety Culture.

Team Resource Management (TRM) is defined as: Strategies for the best use of all available resources - information, equipment and people - to optimise the safety and efficiency of Air Traffic Services. ([www.skybrary.aero](http://www.skybrary.aero)).

EUROCONTROL has been working on TRM since 1995, and now many ANSPs have some form of TRM programme for ATCOs.

## Background

Implementation of TRM is part of the European ATM Masterplan Objective HUM02.1 ***Integrate Human Factors into ATM Operations***, as sub-objective **HUM02.1-ASP02 Implement Best Practices for Team Resource Management (By:12/2012)**

ESARR 3 para 5.2.1 Competency specifies “the ATM service-provider shall ensure that staff are adequately trained, motivated and competent for the job they are required to do, in addition to being properly licensed if so required”. TRM can be one of the ways how an ANSP addresses the ‘motivation’ requirement of ESARR 3.

## Scope of Survey

The survey looked at TRM implementation, particularly the practicalities of the situation in order to draw up a picture as comprehensive as possible regarding the problems met during implementation and also possible solutions/good practices.

## Survey Method and Size

A small questionnaire highlighting key issues regarding this matter was prepared and distributed to members of the Safety Team and Safety Human Performance Sub-Group. The Safety Team were also addressed because not all ANSPs have nominated a representative on the SHP SG.

It was planned to follow the questionnaire by an unstructured telephone interview where clarification was needed. However, as many of the respondents provided detailed answers to the questions posed, this was not necessary. There were several small queries but it was possible to address them through email correspondence.

All EUROCONTROL States were addressed in the request for information. A check with the European Single Sky Implementation (ESSIP) documents reveals that besides Maastricht UAC (MUAC), 35 states are obliged to implement HUM02.1, and not all 39 member states. Twenty-one replies were received – from MUAC, 19 civilian ANSPs or combined civil-military ANSPs and 1 military ANSP, either via the questionnaire or via email exchange. This response represents 58.3% of the member states (including MUAC) obliged to implement TRM through HUM02.1. Although this sample size was not scientifically calculated it was considered to be quite representative of the present situation. Furthermore it was ascertained that the respondents were from different types of ANSPs (e.g. small vs. large, mature vs. developing, high vs. low traffic, geographical location) thereby further strengthening the validity of the responses.

## Results and their Analysis

### TRM Implementation

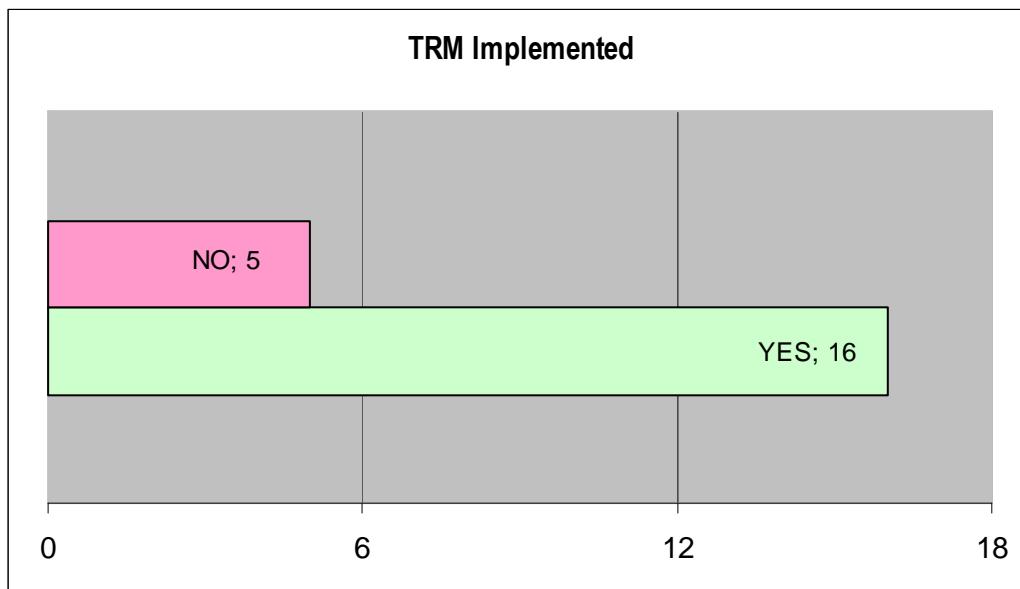


Fig 1

Sixteen respondents have replied that TRM is implemented in their organisation. The remaining five, the ones yet to implement TRM, have indicated that they plan to do so in time to meet the HUM02.1 deadline of December 2012.

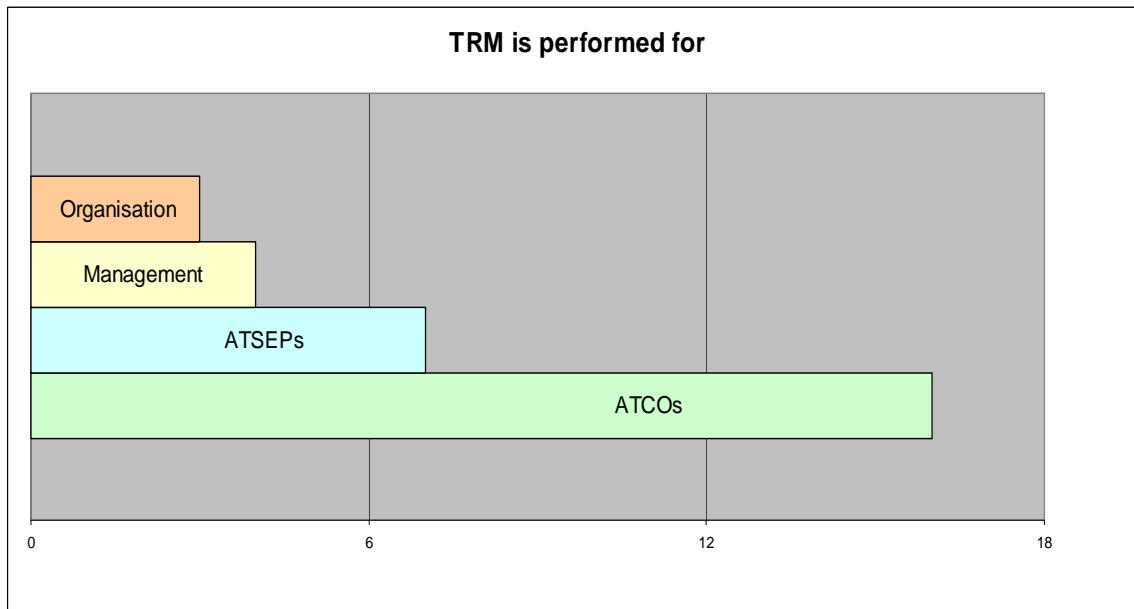


Fig 2

As indicated in Fig 2 some ANSPs have already followed steps to move ahead of TRM, and there are others ready to do so. To support them, EUROCONTROL has decided to investigate new methods to extend TRM across whole Organisation. The new concept, Organisational Resource Management in ATM (ORMA) could be defined as the application of human factors in the ATM system which uses all available organisational resources to achieve safe air navigation service. ORMA will combine individual technical efficiency with the broader goal of organisational coordination.

In some ANSPs Watch Managers and lower (administration) grades or ATC Experts holding valid ATC licences or local ATM unit management also participate in the TRM sessions. However these were considered to be part of the Operational/Engineering Staff for the purposes of the survey.

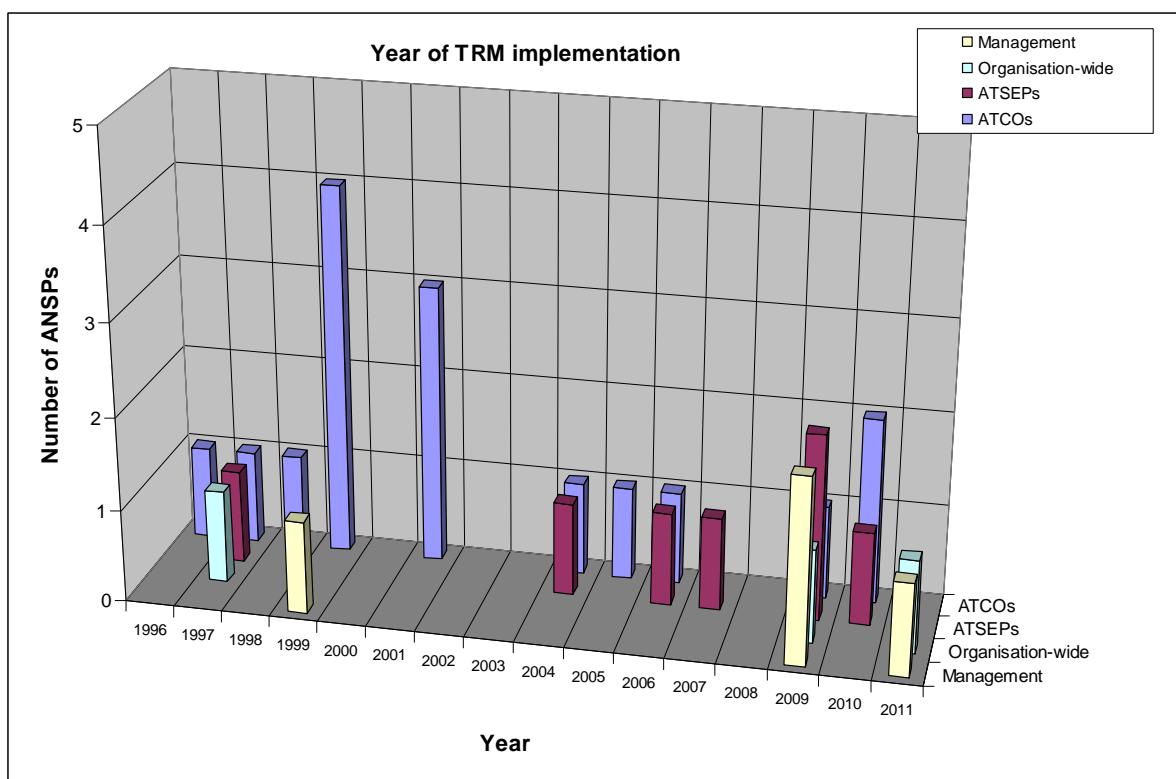


Fig 3

The results in Fig 3 show a wide spread of implementation dates ranging as far back as 1996 to the more recent of 2011. As expected, all respondents indicated that TRM is implemented for ATCOs. Several ANSPs (7), in recent years, have expanded the scope to ATSEPs while others (4) are now also including management and some (3) have implemented an organisation wide programme.

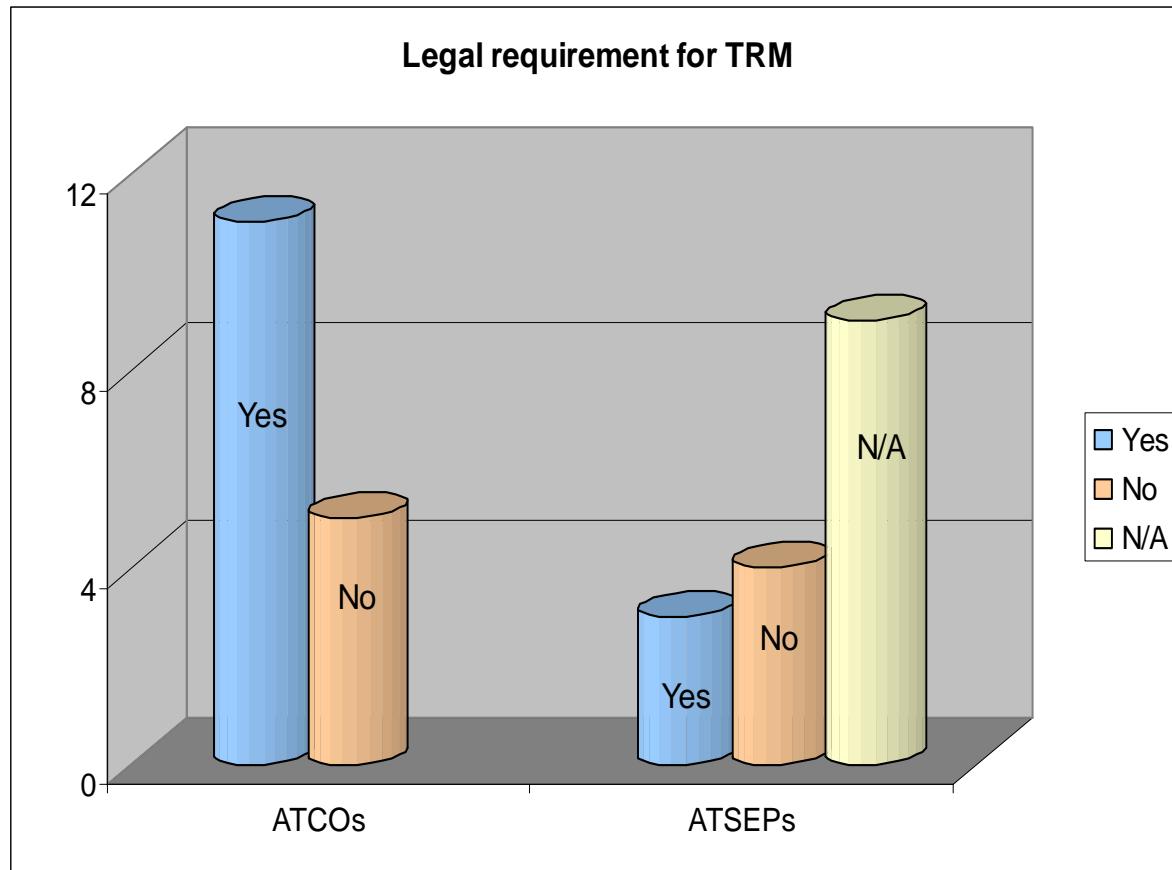


Fig 4

Many ANSPS have indicated that there is a legal requirement for TRM, at least for ATCOs, as clearly shown in Fig 4. Several ANSPs have indicated that TRM implementation should be legally mandated. Most ANSPs do not have a TRM programme for ATSEPs; in such cases this question was considered to be not applicable (N/A).

On the other hand agreement with unions or professional associations seems not to be the norm as indicated in figure overleaf. Again, where ANSPs have not implemented ATSEP TRM, this question was considered as not applicable (N/A). One ANSP indicated that this question was not applicable to ATCOs too.

A significant number of the respondents (11/16) have stated that they have incorporated TRM in ATCO Competency scheme. Another ANSP has replied that TRM is not a direct requirement in their ATCO Competence Scheme but a form of non-technical behaviour is observed as part of refresher training.

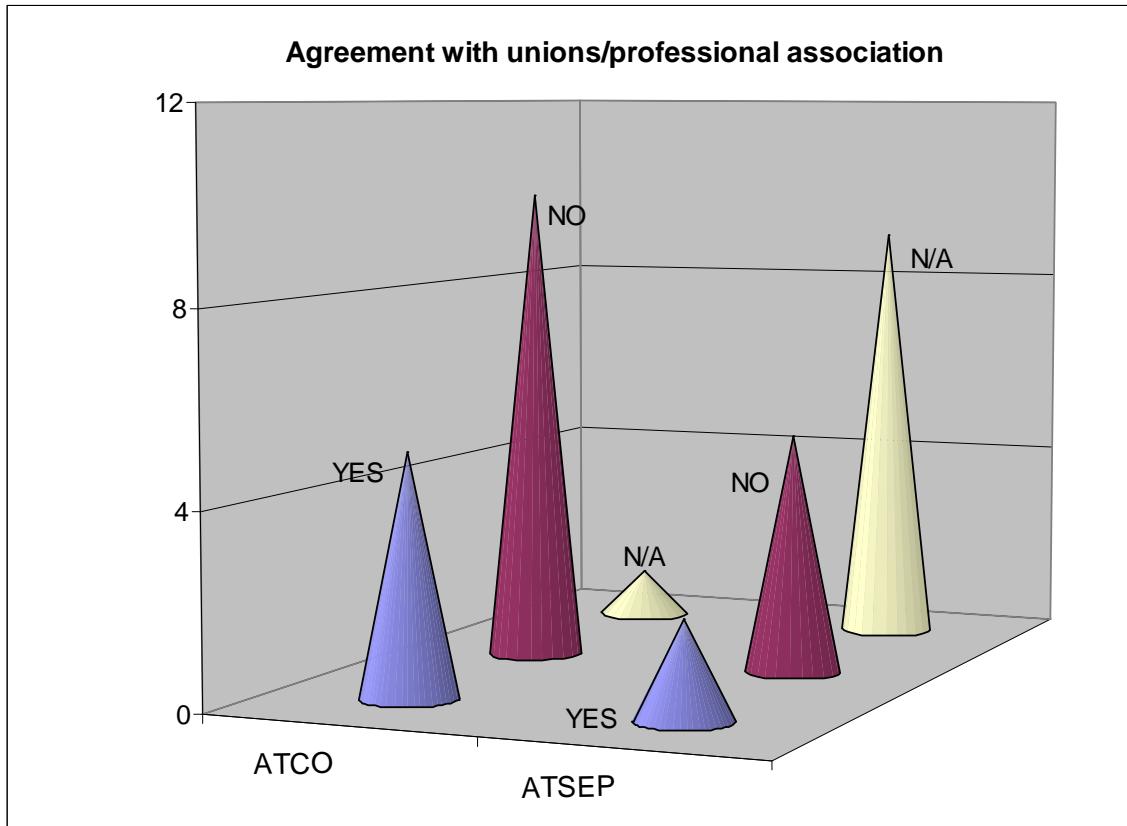


Fig 5

### Joint sessions

Some of the ANSPs reported that joint sessions are held in more than one domain. The results to this question are interesting as it shows that joint ATCO-ATSEPs sessions are minimal while only a few ANSPs include Ops/Engineering Management in their sessions. What is surprising is the number of replies that showed ATCO sessions in conjunction with other professions. The most common of these were pilots, flight data assistants, flight information service staff or military staff (both ATCOs and pilots). The results are shown in Fig 6.

The answer indicating random selection (of staff) may warrant further study to have a better picture of who is involved in these sessions. The key question would be to check if these persons are randomly selected from the Operations Room, or from throughout the unit/organisation.

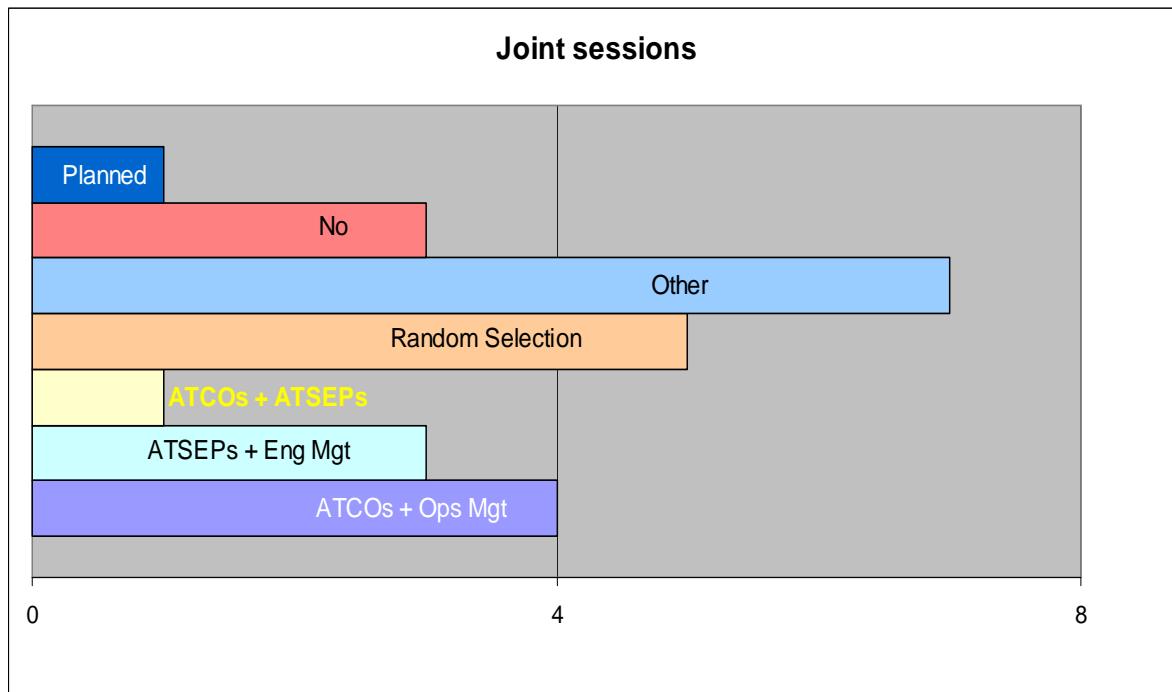


Fig 6

The ANSPs who reported that joint sessions are not done were mostly ones who have introduced TRM only recently. One ANSP has plans for joint TRM sessions in the coming future.

### TRM Facilitators

The majority of respondents indicated that they use in-house facilitators. Only one ANSP replied that their TRM programme is wholly dependent on external facilitators. A number of ANSPs use both internal and external facilitators. In most of the cases where the ANSP is using a mix of in-house and external facilitators, the latter are HP/HF professionals or psychologists. Fig 8 overleaf shows the breakdown of the facilitator background.

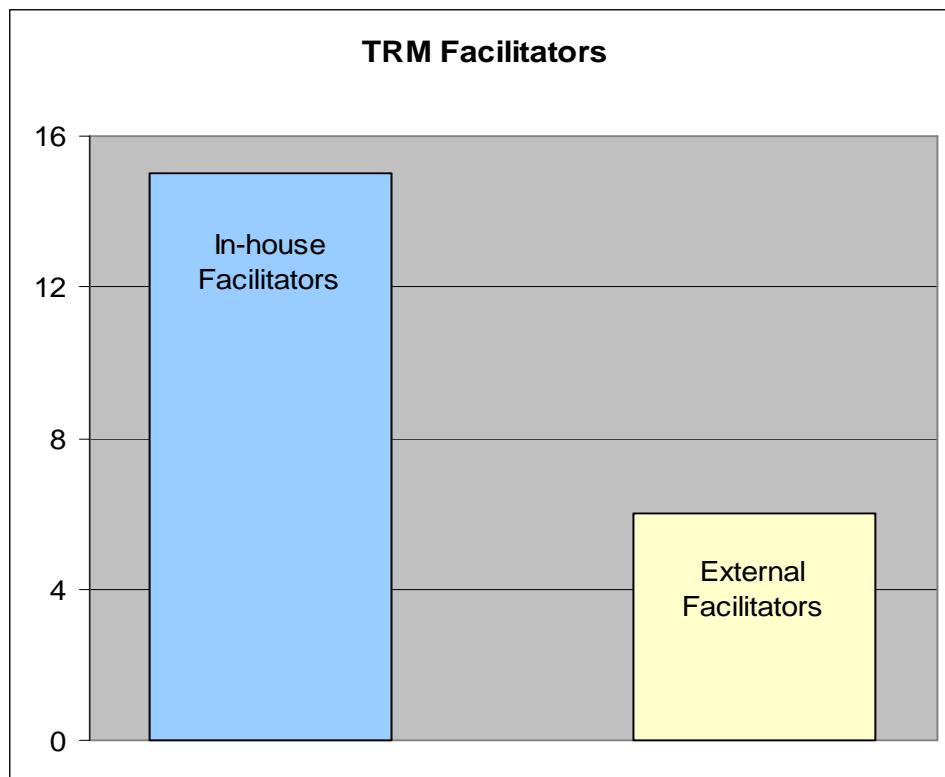


Fig 7

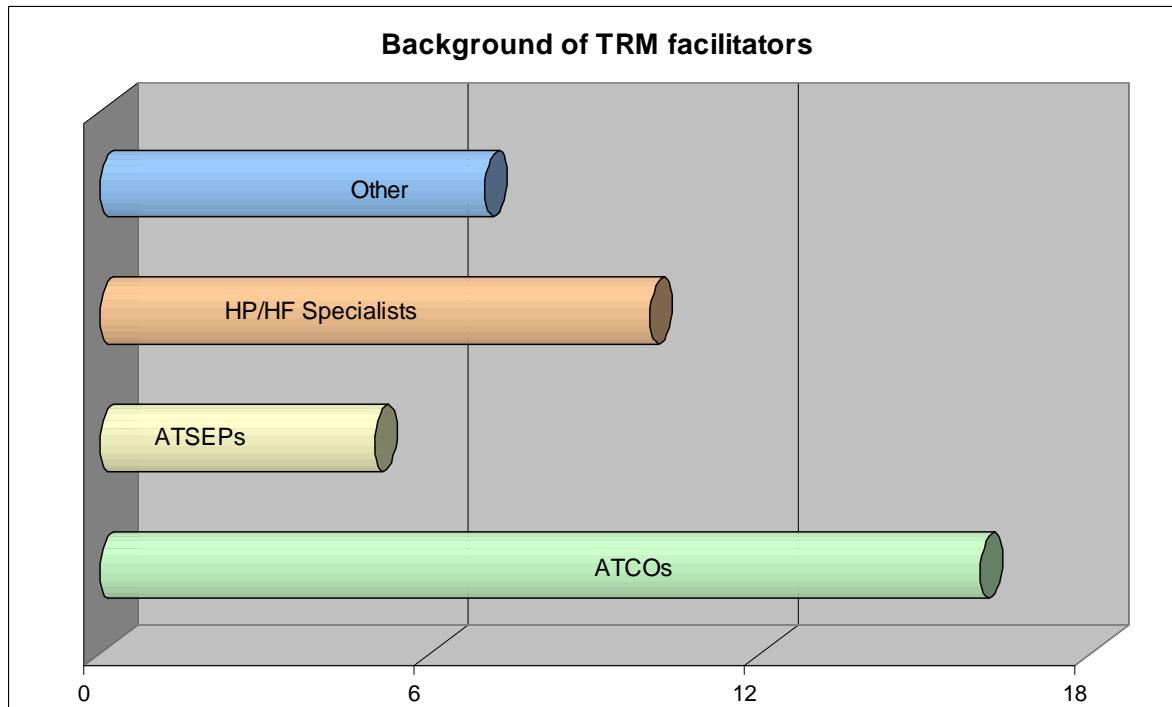


Fig 8

All respondents replied that their facilitators are primarily ATCOs, even the sole ANSP who uses only external facilitators. On the other hand the list of 'Others' is quite diverse and includes airport maintenance staff, CRM facilitators, psychologists, trained facilitators from safety units or human resources departments and Air Traffic Control Assistants.

All facilitators have received training and in some ANSPs the training follows more than one method, as shown in Fig 9.

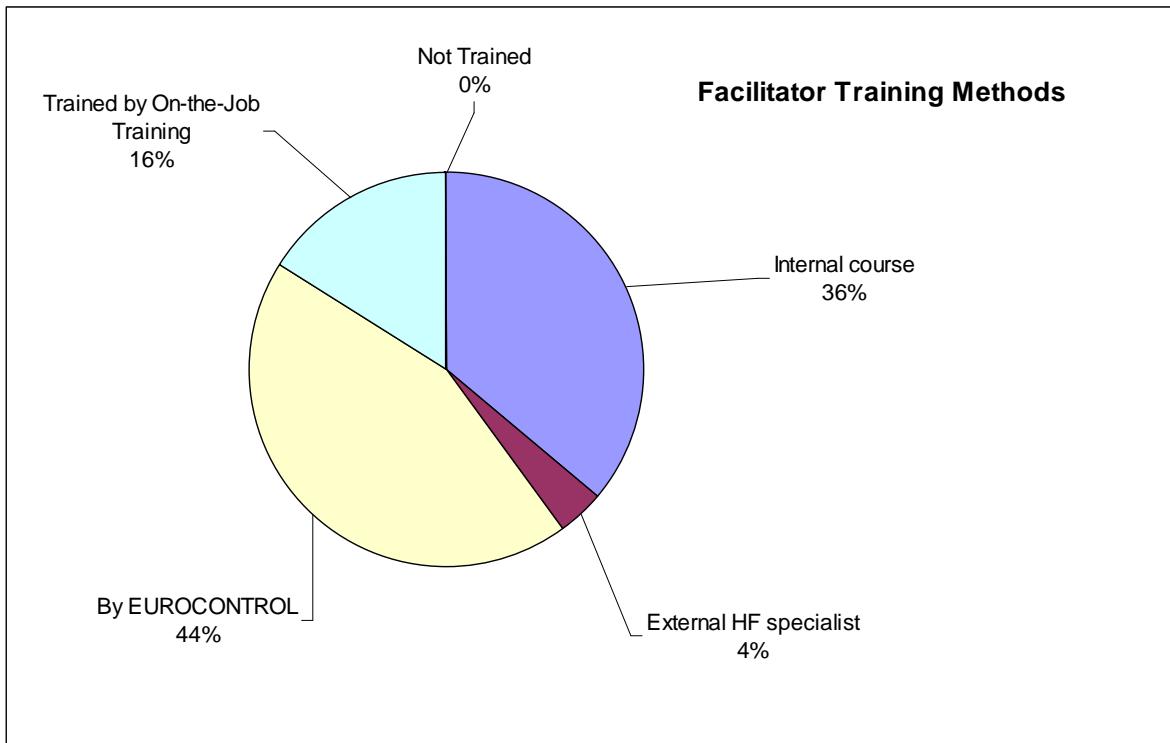


Fig 9

Most facilitators have attended a EUROCONTROL course and some of these, in turn, have conducted internal courses in their organisation. On the other hand some ANSPs have opted to have their own internal course, in some cases developed by local organisations. A small number of ANSPs include on-the-job-training also to improve their facilitators competence.

Facilitator on-going competence is considered essential and the following figure shows the several methods in use.

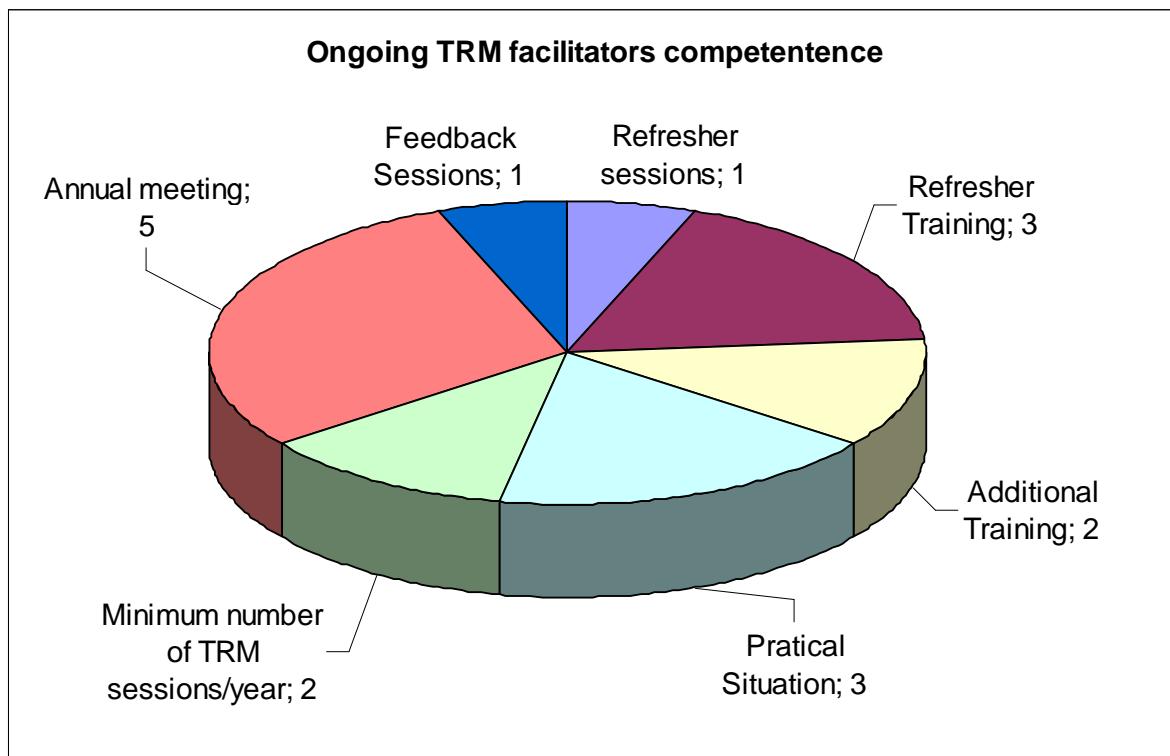


Fig 10

Some ANSPs (3), who have only introduced TRM in recent years, have not yet addressed the matter of on-going facilitator competency.

### Responsibility

Many of the replies received indicated that the Unit Management is primarily responsible to ensure that TRM is performed. Some ANSPs have replied that the responsibility is shared, most commonly with the HP/HF/HR unit or the Training unit. Two ANSPs have replied that in their case the responsibility rests with the Safety Unit or even Senior Management. The replies are shown in the following chart (Fig 11).

The responsible manager for TRM may vary in those ANSPs who have implemented TRM for other professionals besides ATCOs. For example, in one case the Unit Manager was responsible for ATCO TRM but the HF unit was responsible for ATSEP TRM.

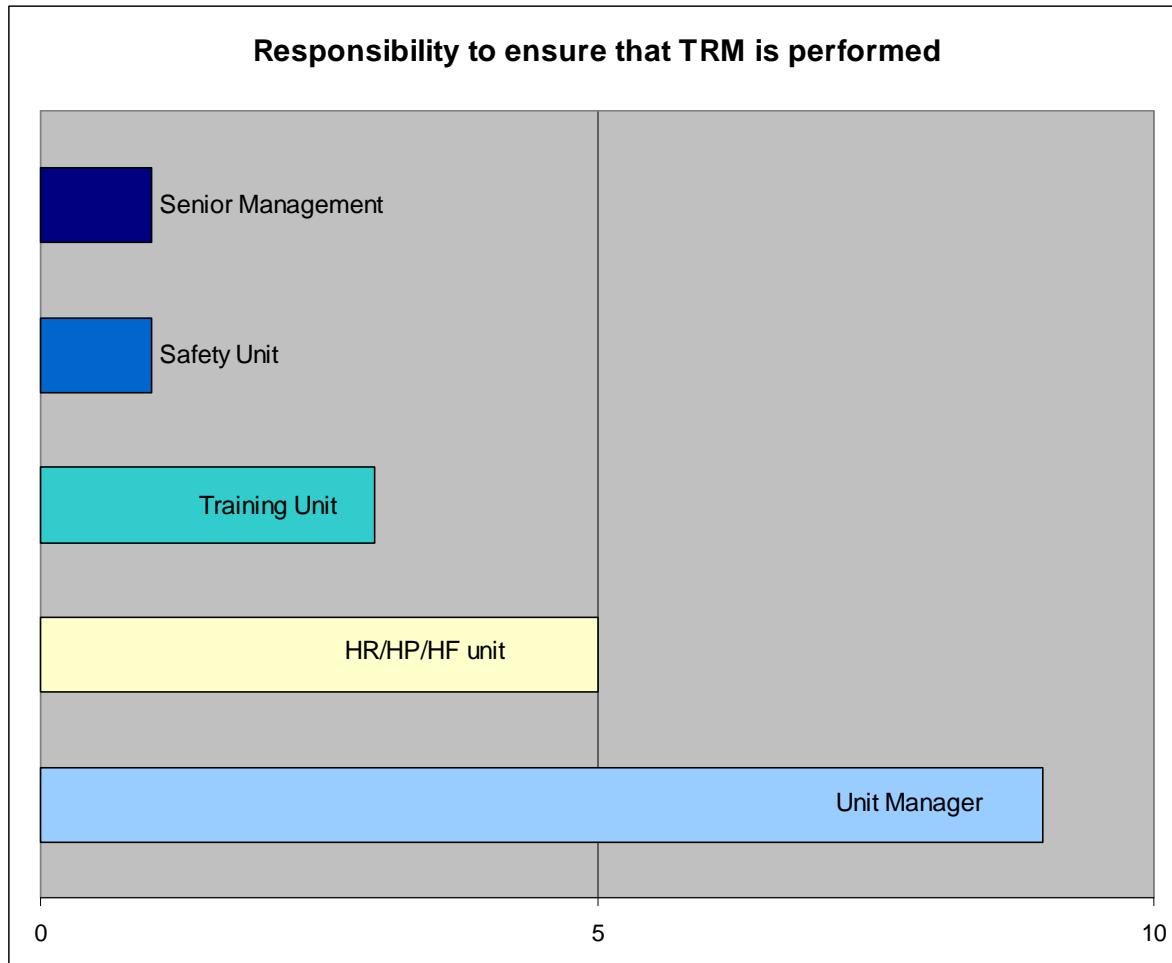


Fig 11

### TRM Sessions

EUROCONTROL, has produced several guidelines on TRM together with developing and delivering several courses on the topic. One of these courses is the TRM Practical Facilitation Skills - an intensive 5-day course where after completing this course, participants will be well equipped to customise and deliver TRM facilitated sessions.

From the results received it is readily apparent that many ANSPs use to some degree EUROCONTROL material. Only three out of the sixteen respondents have replied that they do not use the EUROCONTROL TRM material as indicated in Fig 12 overleaf.

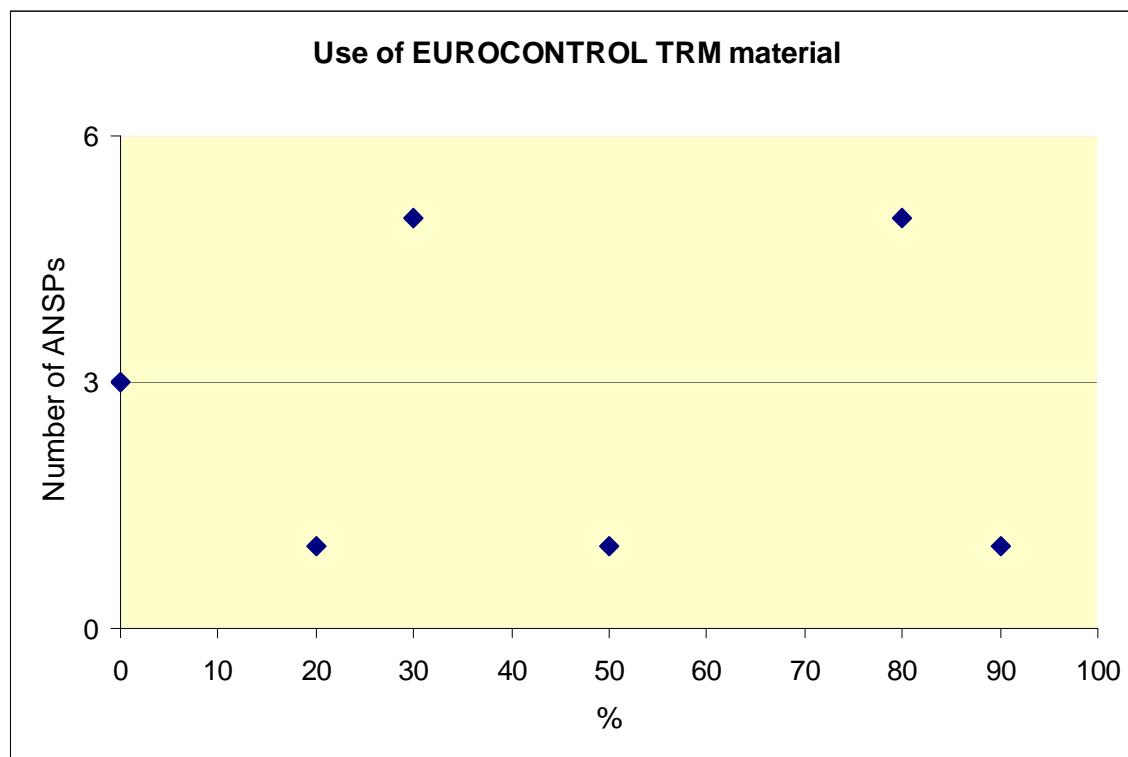


Fig 12

A couple of ANSPs have indicated that the percentage use of EUROCONTROL material inside their organisation differs according to the profession being addressed. While this material is used to a large extent for ATCOs, its use for ATSEP TRM is significantly lower. Where multiple responses were received, for the purposes of the chart, only the highest value was shown.

The number of annual TRM sessions performed varies from ANSP to ANSP. Basically it is a function of their size and maturity. Some ANSPs have a TRM programme to ensure that all staff members attend a TRM session once every so many years. Examples given of these programmes indicated that they were spread over two or three years. On the other hand a few ANSPs use their programme to target a percentage of staff e.g. 10 – 15% of all staff (for whom TRM is provided). Some respondents have stated that they are unable to run as many TRM sessions as they would wish because of staff shortages (facilitators as well as ATCOs). One ANSP has reported that the organisation is considering performing TRM sessions only once every three years but covering all the staff during that year. This is mainly because the TRM programme implemented relies heavily on external facilitators and this once-every-three-years proposal is due to expenditure costs.

From the survey it is readily apparent that the absolute majority of ANSPs (15/16) use local incidents/accidents during their TRM sessions. Sometimes the scenarios used during the session are the unit's own while others prefer to use scenarios based on incidents/accidents far from the unit in training. Only one ANSP does not use local accidents/incidents but TRM has only been recently implemented. It is planned to use such scenarios as the TRM

programme matures. Several ANSPs replied that they only occasionally use local incidents because their courses are focussed more on the positive approach to HF/TRM, such as motivation. One of the larger ANSPs often uses a large inter-centre/unit event if it is deemed useful. Such a session may also include the participation of external stakeholders to have their perspectives, if appropriate.

Feedback from the TRM sessions is used as part of the lesson dissemination process/refresher training by the majority of the respondents (11/16). Some of them use it only to improve the TRM programme while others use the feedback as part of their Operations/Engineering Lessons Learnt process. Most of the ANSPs who have implemented recently still have to apply a feedback process but they recognise the benefits of it and are working to implement it.

### Review of TRM

Only six ANSPs have replied that a review is carried out to identify effects of TRM on the system (People, Procedures, Equipment and Environment). The recent implementation in a number of ANSPs may have contributed to the high number of negative replies as the organisations are still getting to grips with the implementation and have not yet advanced to the review phase. Some of these respondents have indicated that a review will be conducted in the future as their TRM programme matures.

One of the ANSPs who have an organisation wide TRM programme conducts regular evaluation which has clearly indicated that some interaction between different departments has improved, or working processes have been revised or updated due to better mutual understanding. Another ANSP has replied that their review has revealed improved culture within the units but still more work needs to be done to improve culture between units. Another ANSP uses incident analyses as one indicator of the effects of TRM.

A major ANSP has replied that the review is embedded in the TRM programme and forms part of the annual TRM report. In addition the organisation's safety monitoring report endeavours to evaluate if TRM affects safety trends.

## Conclusions

Team Resource Management is well established in nearly all the ANSPs with respect to the ATCOs with the positive replies amounting to 76.2% (16/21) of the responses. Those who have not yet implemented it have until the end of 2012 to do so in order to be compliant with objective ATM02.1 of the ATM Masterplan. All the respondents who do not have yet TRM in place have indicated that they would meet this deadline.

Some of the ANSPs have extended their TRM programmes to cover ATSEPs while a few include management in TRM. A small number have replied that they have an organisation-wide TRM programme.

Many of the ANSPs use feedback gathered from the TRM sessions to make improvements to the programme or as a source of lessons learnt. On the other hand, it seems that very few ANSPs have actually undertaken a survey/review to identify effects of TRM on the system to confirm the benefits of using it. In this current economic climate, all organisations are facing resource constraints which lead to a severe impact on the TRM programme at some of them. With the evolving emphasis on performance based management, a survey of the benefits resulting from TRM could be a way forward to secure the much needed resources to maintain the TRM programme running.

European regulation has not taken on board the ESARR requirement for motivation as part of competency. Although one could argue that now there is no legal mandate for motivated staff, every day life easily shows the negative effects of unmotivated personnel. Empirical evidence indicates that TRM assists in staff motivation. This statement needs to be backed up by scientific study which may provide conclusive proof of the benefits of implementing TRM, safety being the priority but also in terms of cost.

From the survey answers, some of the replies gave the impression that a few respondents considered the present TRM philosophy as maybe not being positive enough with its emphasis of lessons learnt from incidents/accidents. They consider that TRM may have a more positive impact by focussing more on the stability of the team, increased (job) satisfaction and the enhanced sense of working as a part of a larger and more efficient team.

Teaming is an essential component of any culture. This is of greater importance in the high-risk industries. In ATC/ATM it is crucial because, despite all the technological advances, the system is still very much human-centric with coordination/communication between the various ATM components playing a pivotal role in the provision of a safe service. Any means that has a positive impact on team performance will surely lead to an improved overall organisation performance.