



ANNEX C TO TRM GUIDANCE MATERIAL - AIR TRAFFIC CONTROL SAFETY QUESTIONNAIRE

Edition Number : 1.0
Edition Validity Date : 07/08/2019



DOCUMENT CHARACTERISTICS

Document Title	Document Subtitle	Edition Number	Edition Validity Date
ANNEX C TO TRM GUIDANCE MATERIAL - AIR TRAFFIC CONTROL SAFETY QUESTIONNAIRE	Use pop-up to enter value.	1.0	07/08/2019
Abstract			
The Air Traffic Control Safety Questionnaire (ATCSQ) was developed to enable the evaluation of the Team Resource Management (TRM) programme.			
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STATUS AND ACCESSIBILITY			
Status		Accessible via	
Working Draft	<input type="checkbox"/>	Intranet	<input type="checkbox"/>
Draft	<input type="checkbox"/>	Extranet	<input type="checkbox"/>
Proposed Issue	<input type="checkbox"/>	Internet (www.eurocontrol.int)	<input checked="" type="checkbox"/>
Released Issue	<input checked="" type="checkbox"/>		

TLP STATUS		
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ANNEX C TO TRM GUIDANCE MATERIAL - AIR TRAFFIC CONTROL SAFETY QUESTIONNAIRE

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DOCUMENT APPROVAL

The following table identifies all management authorities who have successively approved the present issue of this document.

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Edition History

The following table records the complete history of the successive editions of the present document.

Edition History

Edition No.	Edition Validity Date	Author	Reason
	30/11/1999	Woldring and Isaac	Released Issue (HUM.ET1.ST10.2000-REP-01)
1.0	07/08/2019	Seychell & Bunjevac	Released issue after cosmetic changes and update experience in the use of the ATCSQ



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1 EXECUTIVE SUMMARY

The Guidelines for Developing and Implementing Team Resource Management were issued in 1996 in order to provide management and operational staff with relevant information to consider when developing and implementing TRM.

A TRM training course, together with course content and training objectives was proposed in Chapter 2 of the guidelines. In this training course, it was suggested that Situational Awareness, Decision-making, Communication, Teamwork, Leadership and Stress Management should form the mandatory subjects of a TRM training course.

Over the years, there have been a number of small changes in the training objectives but the basis had remained the same. In the meantime, ICAO had worked on new Procedures for Air Navigation Services (PANS) with respect to ATCO and ATSEP competencies. Naturally such standards, and the methodologies that evolved from them, had to be taken into account also for TRM training.

This revised guidance document details the current prototype TRM modules and maps them with the ICAO ATCO Competencies. Several new modules have been identified as necessary to update the current TRM Guidance Material. Additionally some of the current content needs updating to be aligned closer with ICAO standards on ATCO competence.



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2 ATCSQ

2.1 Overview

The Air Traffic Control Safety Questionnaire (ATCSQ) was developed in the late 1990s by the Team Resource Management Task Force II (TRMTFII)¹ based on the work undertaken in flight crew resource management (FMAQ, Helmreich, Merritt, Sherman, Gregovich & Weiner, 1993) and operation room management (ORMAQ, Helmreich, Schaefer, Hines & Sexton, 1996). The Task Force then introduced, tested and evaluated Team Resource Management (TRM) in a number of European States.

The purpose of the ATCSQ is to enable the evaluation of the TRM programme and the questionnaire consists of four main sections:

- The first section concerns attitudes towards the quality of training, working conditions and documentation.
- The second and third sections contain the main evaluative information, the second being concerned with attitudes and the third with those responses associated with behaviour.
- The fourth section concerns demographic information.

All the areas found in the TRM course appear in the questions. These individual areas are randomly allocated but balanced across the second and third sections.

2.2 Stability and Reliability

The ATCSQ has been subjected to both test-retest and Cronbach Alpha reliability tests. It has proven to be a stable and reliable instrument for the purpose of eliciting responses in the seven domains for which it was designed. Several questions have been identified as needing alteration, particularly in multilingual and multicultural environments.

The ATCSQ has been found to be a useful indicator of attitude change within certain domains. The results of the evaluation of this questionnaire clearly indicate the ATCSQ to be a robust, reliable instrument and informative for the purpose for which it was designed.

Responses concerning the change in attitudes between the two courses are a little more difficult to determine. However, the results indicate that the questionnaire is sensitive to changes in attitude. Clearly with a small number of responses, little can be deduced with any certainty, but with larger samples and strict adherence to data gathering more meaningful results can be achieved. Statistical analysis indicated that there were strong changes with respect to teamwork and team roles between the first and last responses.

¹ Team Resource Management Test and Evaluation HUM.ET1.ST10.2000-DEL02 EDITION DATE: 30.11.1999



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3 THE QUESTIONNAIRE

3.1 Section 1

Please indicate how satisfied you are with each of the following aspects of ATC operations.

Please answer by writing beside each item the letter from the scale below.

A	B	C	D	E
Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory

<input type="checkbox"/> 1. Your own basic ATC training <input type="checkbox"/> 2. Your own basic ATC instructor skills <input type="checkbox"/> 3. Your own validation or recurrent training <input type="checkbox"/> 4. Your own OJT instructor skills <input type="checkbox"/> 5. Simulator training (if relevant) <input type="checkbox"/> 6. Operational Manuals (including Standard Procedures) <input type="checkbox"/> 7. Safety Manuals	<input type="checkbox"/> 8. Shift cycle <input type="checkbox"/> 9. Shift schedule <input type="checkbox"/> 10. Length of leave <input type="checkbox"/> 11. My skills in handling normal operations <input type="checkbox"/> 12. My skills in handling emergencies <input type="checkbox"/> 13. Feedback on my daily operational my daily operational performance
---	---

Please answer the following questions by ticking the box which best describes your opinion.

1. Controllers leave personal problems behind when operating the position.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

2. Automation reduces the requirement for team members to monitor the traffic situation closely.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--



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3. I am less effective when stressed or fatigued.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
<input type="text"/>				

4. It is not my place to give pilots advice other than airways information and clearance details.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
<input type="text"/>				

5. Team members share responsibility for prioritising activities in high workload situations.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
<input type="text"/>				

6. Effective team coordination requires that controllers take the personalities of other controllers into account.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
<input type="text"/>				

7. I am reluctant to disagree with my superiors.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
<input type="text"/>				

8. Controllers should be aware of, and sensitive to, the personal problems of other controllers.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
<input type="text"/>				



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9. I work in an environment where the group's achievements are valued over my individual success.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

10. It is easier to make decisions when you first take over on an operating position.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

11. Asking for assistance makes one appear incompetent.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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12. My suggestions about safety will be acted upon if I express them to management.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

13. To resolve conflicts controllers should openly discuss their strategies with each other.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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14. It is easier to communicate with my own team than other teams and units.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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15. I make better decisions at my workstation when I am given more time to think.

**Strongly
Disagree**

**Slightly
Disagree**

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--

16. Trainees should not question senior team members' decisions.

**Strongly
Disagree**

**Slightly
Disagree**

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--

17. If I perceive a problem with operations, I would speak up, regardless of who may be affected.

**Strongly
Disagree**

**Slightly
Disagree**

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--

18. During periods of low work activity I would rather relax than keep busy with small tasks.

**Strongly
Disagree**

**Slightly
Disagree**

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--

19. Flight crews never demand too much.

**Strongly
Disagree**

**Slightly
Disagree**

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--

20. Controllers do not use their strips to help maintain a mental picture.

**Strongly
Disagree**

**Slightly
Disagree**

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--



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21. Casual, social conversation in the operating environment during periods of low workload can improve team coordination.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

22. My decision-making skill is as good in critical situations as in routine situations.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

23. It is important to avoid negative comments about the procedures and techniques of other controllers.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

24. Discussing the traffic picture with other controllers helps to keep your own picture clearer.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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25. Controllers visibly impaired by alcohol or drugs should be kept from going on duty.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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26. Good communication is as important as technical proficiency in the controlling environment.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--



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27. I like my job.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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28. Only controllers on position should make decisions about opening or collapsing sectors.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

29. My unit would be capable of handling the situation if there was a system breakdown.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

30. I should maintain the traffic picture of the controllers I work with.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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31. Controllers should feel obliged to mention their own psychological stress or physical problems to their co-workers before or during a shift.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

32. The regulatory organisation rules should not be broken.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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33. Our training has prepared us to work as a well coordinated team in an emergency.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

34. Supervisors who encourage suggestions from team members are ineffective.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

35. I should inform those controllers who are affected by my plans and control actions, and ask for their acknowledgement.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

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36. Increased automation reduces the need for team communication.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

37. It is better to agree with other team members than to voice a different opinion.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--

38. I perform as well with other units as with my own.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
----------------------	----------------------	---------	----------------	----------------

--	--	--	--	--



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39. Leadership of the team comes from the sector supervisor.

Strongly
Disagree

Slightly
Disagree

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--

40. I always follow correct phraseology when controlling.

Strongly
Disagree

Slightly
Disagree

Neutral

Slightly Agree

Strongly Agree

--	--	--	--	--



3.2 Section 2

Please answer the following questions by marking on the scale (X) the point which best represents the frequency with which you would agree with the statements in the last six months.

41. In abnormal situations, I rely on my superiors to tell me what to do.

Never						Always				
0%					50%					100%

42. I maintain good interpersonal relationships with fellow controllers.

Never						Always				
0%					50%					100%

43. I make poor decisions when I am fatigued.

Never						Always				
0%					50%					100%

44. I retain a mental picture of the pilot's situation.

Never						Always				
0%					50%					100%

45. I expect to be consulted on matters that affect the performance of my duties.

Never						Always				
0%					50%					100%



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46. When my workload is high I ask for assistance.

Never						Always			
0%					50%				100%

47. The gender of the pilot affects my communication ability.

Never						Always			
0%					50%				100%

48. I critique other controllers' techniques.

Never						Always			
0%					50%				100%

49. Incidents, near-misses, etc., are reported according to the regulations.

Never						Always			
0%					50%				100%

50. I perform effectively during critical operations even when fatigued.

Never						Always			
0%					50%				100%

51. I make judgement errors in emergencies.

Never						Always			
0%					50%				100%



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52. I work with people who cooperate well with one another.

Never						Always			
0%					50%				100%

53. I am distracted from the traffic situation by my thoughts.

Never						Always			
0%					50%				100%

54. My colleagues are adequately trained in emergency procedures.

Never						Always			
0%					50%				100%

55. The OJT instructor should take control of the position in critical and non-standard situations.

Never						Always			
0%					50%				100%

56. We should trust all decisions made by adjacent sectors.

Never						Always			
0%					50%				100%

57. Pilots make more call sign errors than controllers.

Never						Always			
0%					50%				100%



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58. I am encouraged by management to report any unsafe conditions I observe.

Never						Always			
0%					50%				100%

59. My performance is not adversely affected by working with an inexperienced or less capable controller.

Never						Always			
0%					50%				100%

60. Controllers encourage questions by team members during normal operations and critical operations.

Never						Always			
0%					50%				100%

61. Morale in this unit is good.

Never						Always			
0%					50%				100%

62. Uncertain situations require quick decision-making.

Never						Always			
0%					50%				100%

63. Controllers make decisions on their own.

Never						Always			
0%					50%				100%



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64. I let other controllers know when my workload is becoming (or about to become) too high.

Never						Always					
0%						50%					

65. Communication between controllers is reduced when the traffic is busy.

Never						Always					
0%						50%					

66. I find it more difficult to maintain the traffic picture when I am tired.

Never						Always					
0%						50%					

67. The executive controller should always take control in an emergency.

Never						Always					
0%						50%					

68. I know if pilots are under-confident when they are on the radio.

Never						Always					
0%						50%					

69. I feel nervous or tense at work

Never						Always					
0%						50%					



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70. I become impatient with flight crews who expect a lot.

Never						Always			
0%					50%				100%

71. Each controller should monitor other controllers for signs of stress or fatigue.

Never						Always			
0%					50%				100%

72. Personal problems adversely affect my performance.

Never						Always			
0%					50%				100%

73. Handovers are provided improperly.

Never						Always			
0%					50%				100%

74. Controllers should question the decisions or actions of other controllers.

Never						Always			
0%					50%				100%

75. Management compromises safety for profitability.

Never						Always			
0%					50%				100%



76. Controllers in my work environment are afraid to express disagreement with their supervisors.

Never						Always			
0%					50%				100%

3.3 Section 3

This section describes briefly styles of leadership. Please read the descriptions, thinking of your ideas as well as your typical supervisor.

Style 1.

Usually makes his/her own decisions promptly and communicates them to his/her subordinates clearly and firmly. Expects them to carry out the decisions loyally and without raising difficulties.

Style 2.

Usually makes his/her decisions promptly, but, before going ahead, tries to explain them fully to his/her subordinates. Gives them the reasons for the decisions and answers whatever questions they may have.

Style 3.

Usually consults with his/her subordinates before he/she reaches his/her decisions. Listens to their advice, considers it, then announces his/her decision. He/she then expects all to work loyally to implement it whether or not it is in accordance with the advice they gave.

Style 4.

Usually calls a meeting of his/her subordinates when there is an important decision to be made. Puts the problem before the group and invites discussion. Accepts the majority viewpoint as the decision.



77. Which of the above styles of leadership would you most prefer to work under?
(Circle one answer only.)

Style 1

Style 2

Style 3

Style 4

78. In your organisation, which one of the above styles do you find yourself most often working under?

(Circle one answer only.)

Style 1

Style 2

Style 3

Style 4

3.4 Section 4

Please describe who you are by answering the following questions regarding demographic information.

What is your ATC experience

Years in ATC	_____	Years in TWR	_____
Years in this ATC unit	_____	Years in APP	_____
Years in ACC	_____		

What is your present position in your ATC unit? (You may tick more than one.):

<input type="checkbox"/>	Tower controller	<input type="checkbox"/>	Sector chief
<input type="checkbox"/>	Approach controller	<input type="checkbox"/>	OJT-instructor
<input type="checkbox"/>	Area controller	<input type="checkbox"/>	Supervisor
<input type="checkbox"/>	Student	<input type="checkbox"/>	Other (Please specify) _____

Where is your present unit?

Male (M)

Female (F)



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4 AN EXAMPLE OF ATSCQ USE

4.1 Austro Control

TRM was implemented a in the 90s but after some time ATCOs stopped engaging into it. Then TRM was restarted with tower and approach after new facilitators were trained who also started training HF in the basic training. In 2016, training commenced at the ACC. Austro Control uses a Continuous Improvement Database to provide markers and aspects to be addressed in TRM, e.g. executive and planner task shift and drifting into failures.

The campaign was considered to be very successful and several recommendations were derived. It was encouraging for ATCOs to see the results of the workshops and the follow up actions which had driven changes. The selection of attendees was at random apart for guaranteeing variety in roles and age range.

A point often raised is to show how effective the TRM programme is. Therefore the question is how to evaluate such a programme. Preliminary studies had shown TRM had an impact and had made a difference especially in high workload.

Austro Control evaluated the effectiveness of TRM in Vienna ACC via a customised version of the ATC Safety Questionnaire. The original ATCSQ has about 80 questions addressing 7 areas. The Austro Control questionnaire was simplified and had about 30 questions addressing 6 areas. The study was done by first administering the test to the ATCOs prior to their attendance in a TRM session. The test was again done after some weeks when the ATCOs had had the opportunity to first attend a TRM session and then work some time in position, hopefully applying some of the things learned from the TRM session.

A quick overview of the results indicated:

- Significant change was found in the satisfaction with the shift cycle, particularly - success was related to team achievement rather than individual achievement. Team members share responsibility in situations of high workload to prioritize work.
- Positive changes in attitude concerning operative issues were indicated.
- People were pleased to share their concerns.

Sections of Evaluation Questionnaire

(based on ATCSQ by Woldring & Isaac 1999)

Part 1 Satisfaction	<ul style="list-style-type: none"> • Satisfaction with ATC operations
	<ul style="list-style-type: none"> • Answer scale “very unsatisfactory – very satisfactory”
Part 2 Attitude	<ul style="list-style-type: none"> • Agreement of attitude with operational issues
	<ul style="list-style-type: none"> • Answer scale “strongly disagree –strongly agree“
Part 3 Behaviour	<ul style="list-style-type: none"> • Agreement of behaviour toward ATCO work
	<ul style="list-style-type: none"> • Agreed on percentage scale (0 – 100%)
Part 4 Open Questions	<ul style="list-style-type: none"> • Most important content of the training
	<ul style="list-style-type: none"> • Topics of the training which were already implemented in the operative workplace

Table 1 Sections of the Evaluation Questionnaire

Results

Questions with significant changes in attitude

Team members share responsibility in situations of high workload to prioritize activities.	+
I work in an environment where group services are more appreciated than personal success.	+
Good communication in the control environment is as important as technical skills.	-
Leadership in the team comes from the sector supervisor	+
I always follow the correct phraseology when I am controlling	+

Table 2 Questions with significant changes in attitude

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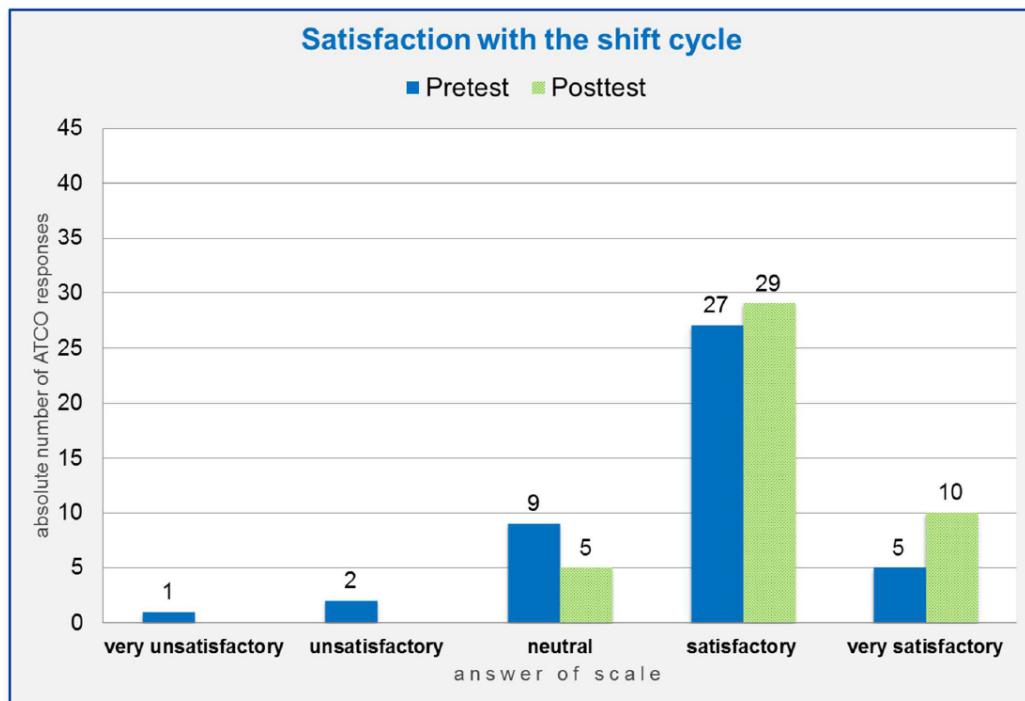


Figure 1 Results – Satisfaction with the shift cycle

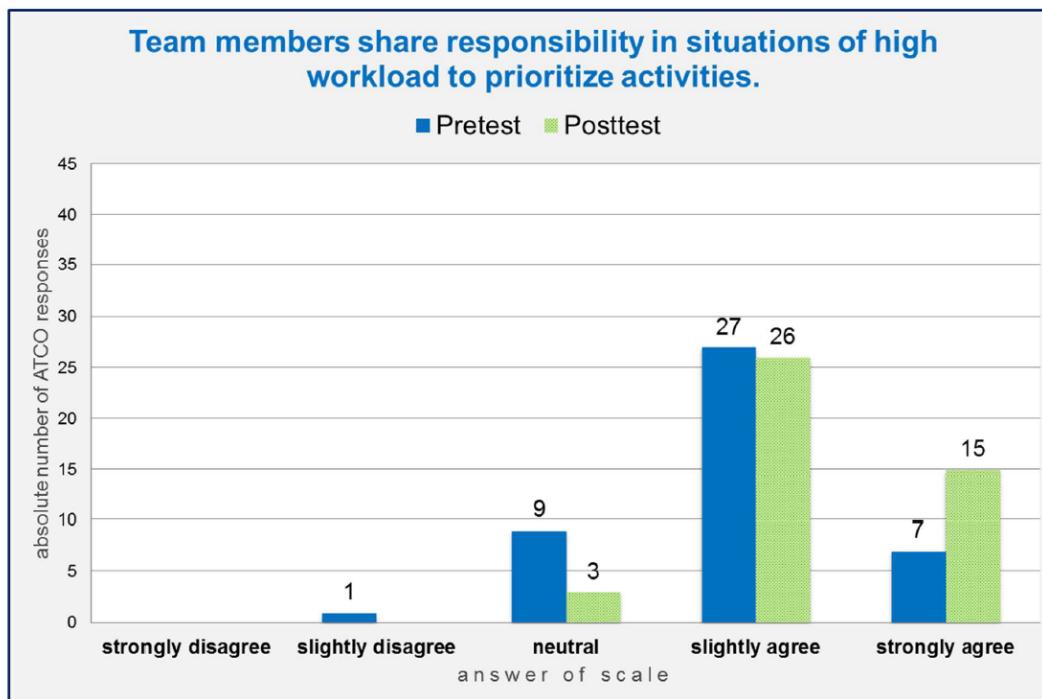


Figure 2 Results – Team members share responsibility in situations of high workload to prioritize activities

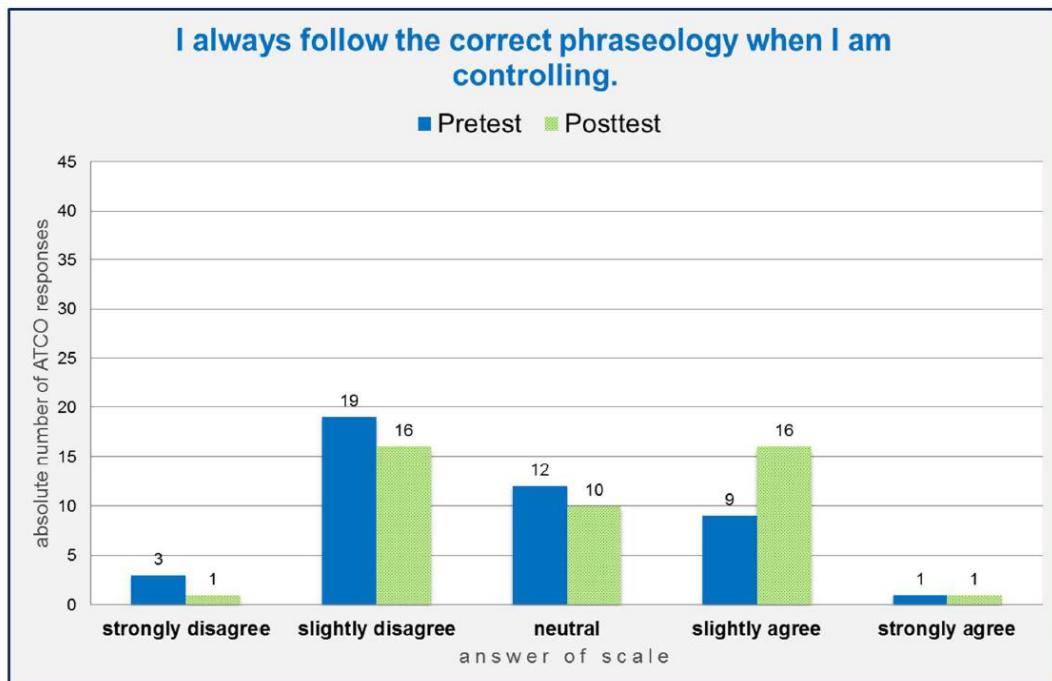


Figure 3 Results – I always follow the correct phraseology when I am controlling



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5 ABBREVIATIONS AND ACRONYMS

ANSP	Air Navigation Services Provider
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
ATSEP	Air Traffic Safety Electronics Personnel
HF	Human Factors
ICAO	International Civil Aviation Organisation
TRM	Team Resource Management



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