~~Official: Sensitive~~

Note: While superseded in 2015, this document has been reclassified following a review of content IAW CSMP Instruction (PM) 11-3-01 Security Classification & Categorisation Guide (SCCG) Version 2.2.

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TRAINING MANAGEMENT PACKAGE

SECTION 5
TRAINEE MANUAL

CCSM MSC DSC Operator

100356

Date of Issue: 16 Dec 2015

Training Development Authority: Manager Training Systems - STSC

Conduct of Training Authority: Manager Engineering Training - STSC

Version Control Data

Title:	CCSM Submarine Helmsman
Responsibility:	s47E(d)
Approver and date:	OIC MTS 16Dec2015
Version number:	v1.0_12_2015
Date of approval (for last modification):	CDCP 0829 16 Dec 2015
Next review due:	Approval Date + 24 months

Document History

Version	Date	Status	Author	CDCP No	Short Description of changes
v1.0_12_2015	16Dec15	Active	s47E(d)	0829	Develop trainee manual for the MSC DSC Operator course
		Superseded			
	22 Mar 24	s47E(d)			Classification assigned Official on review of content

Copyright

Conditions of Release

References:

A. Defence Security Manual.

B. DI (G) OPS 13-4 *Release of Classified Defence Information to Other Countries*.

This work contains valuable Australian Defence information. In accordance with the references above the following minimum conditions of release apply:

- The Training Management Package is not to be used for any purpose other than Australian military training without written authorisation from the Training Authority – Submarines or their nominated delegate.
- Security handling and storage commensurate with the classification of the Training Management Package are to be observed in accordance with the Defence Security Manual.
- The security classification indicated on the cover applies to all parts of this document. The classification cannot be downgraded without the relevant Training Advisor's approval.
- The contents are not to be divulged to non-Defence organisations, including other Commonwealth Agencies, or individuals unless authorised in writing by the Training Authority – Submarines or their nominated delegate.
- The document is not to be released to foreign governments without written authority from the Training Authority - Submarines or their nominated delegate and with reference to DI(G) OPS 13-4.

WARNING

This document is a training aid only. It does not replace any reference materials or equipment nor is it intended as a technical manual but designed for use as a Training Aid

Table of Contents

Table of Tables

General Information

Course Length

15 days

Aim

On completion of this course you will have the competence to operate the Diving and Safety Console in the Submarine Control Simulator and be ready to proceed to the sea training phase

Course Structure

The course comprises Instructor led lessons and Simulator training. Where possible each lesson or section will start with an instructor led introduction. This will then be reinforced by a simulator session followed by an instructor led debriefing in the classroom.

Course Times

(Day Shift) Hours	Mon to Thurs 0745 – 1630 Friday 0700 – 11:30
(Afternoon Shift) Hours	Mon to Thurs 1600 – 2359 Friday 13:00 – 16:00
OR	
(1st Shift) Hours	Mon to Thurs 0700 – 1500 Friday 0700 – 11:30
(2nd Shift) Hours	Mon to Thurs 1100 – 1900 Friday 13:00 – 16:00
(3rd Shift) Hours	Mon to Thurs 1700 – 0100 Friday 16:00 – 20:00

Testing

All testing on this course is conducted in a “Rolling Assessment” format through the use of a Summative Rolling Practical Assessment Record (SRPAR). Assessment will be ongoing throughout the course with the final assessment being recorded as “Achieved” or “Not Achieved”. You will be provided with a copy of the assessment.

Pre-Course Diagnostic tool

A pre-course diagnostic tool will be completed by each student on day one of the course. This is designed to assess the level of knowledge you have retained from your previous training and to highlight any weak areas you may have. It provides your instructor a clue as to where the level of training on this course should commence. The diagnostic tool will not count towards the overall course results, but a very poor result could incur the raising of a Training Progress Report (TPR) by the instructor.

Task Book

Upon successful completion of this course you will be required to complete a competency log whilst watch keeping under supervision as a consol operator onboard a submarine at sea, until certified by command as a qualified console operator

Problems

Any problems, deficiencies or errors that are encountered during the course are to be brought to the attention of the instructor.

Questions

Do not hesitate to identify to the instructor any difficulties or general problems you have with the course content or structure.

Information

A CAI classroom will be made available for you use throughout the duration of the course.

Trainee Manuals

The Trainee Manual is written for use within the Diving and Safety Console (DSC) Operations. The Trainee Manual should be used in conjunction with relevant system ABR's, CAI and any other documentation issued during previous courses.

The Manual and other courseware developed for this course is not to be referenced as authorised equipment manuals or official RAN Publications. Always refer to the relevant ABR/TEM for a detailed explanation of systems or procedures.

References

ABR 6009	Emergency Operating Procedures (EOP's)
SSO's	Standard Operating Procedures (SOP's)

Course Critique

A Course Critique will be provided to you by your instructor at the end of the course. Please take the time to complete it honestly. An envelope will be available for the Course Critique sheets and will be sealed and presented to the QCO.

100356 Diving and Safety Console (DSC) Operator - Learning Outcomes

On completion of this course the trainee will have the competence to operate the Diving and Safety Console (DSC) in the Submarine Control Simulator (SCS)

The course consists of the following Assessed Learning Outcomes (LO) and Assessment Criteria (AC):

- **LO 1 Describe the Diving and Safety Console DSC layout**
  - AC 1.1 Describe the DSC panel layouts
  - AC 1.2 Review auxiliary platform systems

- **LO 2 Control and monitor the operation of auxiliary systems from the Diving and Safety Console**
  - AC 2.1 Control and monitor masts and lighting
  - AC 2.2 Control and monitor the Main Bilge system
  - AC 2.3 Control and monitor the Daily bilge and Sewage system
  - AC 2.4 Control and monitor the Ventilation system
  - AC 2.5 Monitor the HP and LP Air systems
  - AC 2.6 Control and monitor the INT/EXT Hydraulic systems

- **LO 3 Operate the submarine systems as a DSC operator**
  - AC 3.1 Carry out DSC actions whilst conducting and Urgent Depth Change (UDC)
  - AC 3.2 Carry out DSC actions for a Return to Periscope Depth RPTD
  - AC 3.3 Carry out DSC actions for a Snort for a battery charge
  - AC 3.4 Carry out DSC actions for a High pressure (HP)/ Low pressure (LP) Air burst
  - AC 3.5 Carry out DSC actions for a main propulsion system failure
  - AC 3.6 Carry out DSC actions to respond to manoeuvring system failures
  - AC 3.7 Carry out DSC actions to Dive the submarine
  - AC 3.8 Carry out DSC actions to Surface the submarine
  - AC 3.9 Carry out DSC actions to achieve Emergency stations
  - AC 3.10 Carry out DSC actions for a Collision Dived
  - AC 3.11 Carry out DSC actions for a Hydraulic bursts and Failures
  - AC 3.12 Carry out DSC actions for a Grounding Dived
  - AC 3.13 Carry out DSC actions for a Flood
  - AC 3.14 Carry out DSC actions for a Fire
  - AC 3.15 Carry out DSC actions for a Toxic Gas
  - AC 3.16 Carry out DSC actions for Multiple incidents
  - AC 3.17 Carry out DSC actions for Standard watch keeping practices

EOP / SOP (ABR 6009 & SSOs)

The following list of EOPs / SOPs represents the general basis of instruction for MSC DSC Operator course students. As such, total familiarity with these procedures is required as soon as possible.

	TITLE	SECT	CHAPTER
1.	EMERGENCY STATIONS	2	1
2.	COLLISION	2	5
3.	EMERGENCY ATMOSPHERE MONITORING	2	8
4.	ENGINE RUN ON	2	9
5.	FIRE	2	10
6.	FLOODING	2	11
7.	GROUNDING	2	12
8.	HP AIR BURST	2	13
9.	HYDRAULIC BURST	2	14
10.	HYDRAULIC FAILURE	2	15
11.	MAN OVERBOARD	2	16
12.	MANOEUVRING SYSTEM FAILURE	2	17
13.	PROPULSION SYSTEM FAILURE	2	20
14.	TOXIC GAS CLEARANCE	2	23
15.	URGENT DEPTH CHANGE	2	24
16.	PROCEDURE FOR CONDUCT OF HQ1	2	25
17.	RETURNING TO PERISCOPE DEPTH	SSO	SOP 1401
18.	SNORTING FOR BATTERY CHARGE	SSO	SOP 1402
19.	DIVING	SSO	SOP 1404
20.	SURFACING	SSO	SOP 1405
21.	EMERGENCY PROPULSION UNIT	SSO	SOP 1413

Table 1 - EOPs and SOPs

ISCMMS Pages

Complete the ISCMMS page numbers for the relevant pages below

Hydraulics _____

Hydraulics (water in oil) _____

Air Conditioning _____

Ambient Conditions _____

Main Bilge Bilges _____

Daily Bilge _____

Sewage _____

Main Bilge Ballast _____

Induction/Exhaust _____

Battery % _____

BBV/Charging Rate _____/_____

Atmosphere monitoring _____

Gas Trends _____

Fire detection _____

Fire detection (fwd & aft) _____/_____

Conning Orders

Heading

Heading Mode Auto – Surfaced / Dived

OOW Orders	"PORT / STBD Wheel, Steer _____ " (Course)
MCC Responds	"PORT / STBD Wheel, Steer Aye Sir / Ma'am"

MCC Enters new course into MCC using the Port / Stbd key and numeric keys or Set Head function on Pg 201

MCC Reports	"PORT / STBD Wheel on Sir / Ma'am"
MCC Reports	"10 Degrees to course, Sir / Ma'am"
MCC Reports	"On Course _____, Sir / Ma'am"

Notes:
• When dived, Stern Arcs can be ordered at the same time if the ordered heading change is in excess of 10 degrees

Heading Mode Manual / Emergency – Surfaced

OOW Orders	"PORT / STBD 15, Altering _____" (Course)

MCC Moves Steering Stick in the ordered direction to correct angle

MCC Responds / Reports	"PORT / STBD 15, Altering _____". Aye Sir / Ma'am, "15 degrees of PORT / STBD wheel on Sir / Ma'am"

MCC Enters new course into MCC using the Port / Stbd key and numeric keys or Set Head function on Pg 201

MCC Reports	"10 Degrees to course, Sir / Ma'am"
OOW Orders	"Midships" (normally within 5 degrees of the ordered course)
MCC Responds /Reports	"Midships Aye"
Centres Control Surfaces and reports	"Wheels amidships Sir / Ma'am"
OOW Orders	"Steer _____"
MCC Responds / Reports	"Steer _____, Aye Sir / Ma'am" "On Course _____Sir / Ma'am"

Notes:
• Standard wheel is 15 degrees and is used for planning purposes. Cardinal compass points are to be called (eg "Passing through North/S/E/W")

Changing Heading Mode

Heading Mode Auto / Manual

OOW Orders	"Select Heading Mode Auto / Manual"
MCC Responds	"Select Heading Mode Auto / Manual Aye Sir / Ma'am"

MCC Selects the ordered Heading mode

MCC Reports “Heading Mode Auto / Manual Selected Sir / Ma’am”

Changing Steering Mode

Emergency Modes
OOW Orders "Select Emergency Mode 1 or 2"
MCC Responds "Select Emergency Mode 1 or 2 Aye Sir / Ma'am"

MCC Selects the ordered Emergency mode

MCC Reports "Emergency Mode 1 or 2 Selected Sir / Ma'am"

Reverting from Emergency to Normal
OOW Orders "Select Steering Mode Normal"
MCC Responds "Select Steering Mode Normal Aye Sir / Ma'am"

MCC Selects Steering Mode Normal

MCC Reports "Steering Mode Normal selected, Heading mode MAN / AUTO selected, Course to Steer _____ On course (or regaining, if off course) Sir / Ma'am

Miscellaneous Orders

Midships
OOW Orders "Midships"
MCC Responds "Midships, Aye Sir / Ma'am"

MCC Centres Control Surfaces

MCC Reports "Wheel Amidships Sir / Ma'am" (continually calls ships head every degree of change)
The OOW will then give further conning orders eg. "Steer _____ (Course)"

Steady
OOW Orders "Steady"

MCC Centres Control Surfaces and steers heading shown by ships head indicator

MCC Responds "Steady – Ship's head _____degrees"

s33(a)(ii)

EMERGENCY Involves Engineering department personnel closing up at SSD iaw ABR6009

Increasing / Decreasing Main Motor Revolutions
OOW Orders "Ahead / Astern Revolutions _____"
MCC Responds "Ahead / Astern Revolutions _____Aye Sir / Ma'am"

MCC Selects the ordered Revolutions

MCC Reports "Revolutions Ahead / Astern _____Ordered Sir / Ma'am"

Once revolutions start increasing / decreasing

MCC Reports "Revolutions increasing / decreasing Sir / Ma'am"

When the ordered revolutions are achieved

MCC Reports "Revolutions Ahead / Astern _____Set Sir / Ma'am"

Stopping Main Motor
OOW Orders "Stop Main Motor"
MCC Responds "Stop Main Motor Aye Sir / Ma'am"

MCC Selects the ordered Revolutions

MCC Reports "Stop Main Motor ordered, Revolutions decreasing, speed by log Sir / Ma'am"

Calling Log Speed
When revolutions are changed there is a requirement to report the submarine's "Speed by Log" as follows:

s33(a)(ii)

Enabling the Speed Selector
OOW Orders "Stop Main Motor"
MCC Responds "Stop Main Motor Aye Sir / Ma'am"

MCC *Selects the ordered Revolutions*

MCC Reports "Stop Main Motor ordered, Revolutions decreasing, speed by log Sir / Ma'am"
OOW Orders "Enable the Speed Selector"
MCC Responds "Enable the Speed Selector Aye Sir / Ma'am"

s33(a)(ii)

MCC Reports "Speed Selector enabled, Stop Main Motor ordered"

Uncontrolled Orders

The following orders are listed to provide further examples of common orders and communications conducted between the helm and the OOW. s33(a)(ii)

Example 1

Helm: "Bridge, Helm. Permission for AB Smith to the bridge to relieve the lookout. There are 3 names on the checkout board"

Bridge: "AB Smith to the bridge to relieve the lookout. 3 names correct"

Helm: "AB Smith to the bridge to relieve the lookout. 3 names correct. Helm Aye"

In this instance you (the helmsman) are 'suggesting' to the OOW that there is a relief available for the current lookout. It is up to the OOW to actually 'order' his replacement to have access external to the pressure hull.

Example 2

Bridge: "Helm, Bridge. Pass to the relieving OOW that it is cold and wet on the bridge. Foul weather gear is required"

Helm: "Pass to the relieving OOW that it is cold and wet on the bridge. Foul weather gear is required. Helm Aye"

Helm: "Bridge, Helm. Your message passed to the relieving OOW"

Bridge: "Bridge, Roger"

Example 3

Bridge: "Helm, Bridge. One hand into the tower to shut and clip the conning tower upper and lower lids"

Helm: **"**One hand into the tower to shut and clip the conning tower upper and lower lids. Helm Aye"

Helm: "Bridge, Helm. Conning tower upper and lower lids shut and clipped, tower clear"

Bridge: "Conning tower upper and lower lids shut and clipped, tower clear. Bridge Roger"

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TRAINING MANAGEMENT PACKAGE

SECTION 5
TRAINEE MANUAL

CCSM Manoeuvring Control Console

100358

Date of Issue: 22nd Sep 2014

Training Development Authority: Manager Training Systems

Conduct of Training Authority: Manager Engineering Training

Version Control Data

Title:	CCSM Manoeuvring Control Console
Responsibility:	Prepared by s47E(d)
Approver and date:	MTS, TA-SM, 182330 – 22 Sep 2014
Version number:	v1.1_09_2014
Date of approval (for last modification):	CDCP 972 – 22 Sep 2014
Next review due:	2015

Document History

Version	Date	Status	Author	CDCP No	Short Description of changes
V1.0_07_2013	Jul 2013	Superseded	s47E(d)	712	Reformatted into new template Changes made iaw QC report 29Aug12
V1.1_09_2014	Sep 2014	Active	s47E(d)	972	Changes to propulsion orders iaw AFTP 30 B page 20

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Table of Contents

Table of Tables

General Information

Course Length.

10 days for 2 students

15 days for 3 students

Aim.

On completion of this course you will have the competence to operate the Manoeuvring Control console in the Submarine Control Simulator and be ready to proceed to the sea training phase.

Course Structure.

The course comprises of Computer Aided Instruction (CAI), Instructor led lessons and Simulator training. Where possible each lesson or section will start with an instructor led introduction. This will then be reinforced by a simulator session followed by an instructor led debriefing in the classroom.

Course times.

Day Shift		0745 – 1600
Afternoon Shift		1600 – 2359
	OR	
(1st Shift)		0700 – 1500
(2nd Shift)		1300 – 1900
(3rd Shift)		1700 - 0100

Assessment.

The assessment for this course is conducted in a “Rolling Assessment” format through the use of a Practical Assessment Record (PAR). Assessment will be ongoing throughout the course with the final assessment being recorded as “Achieved” or “Not Achieved”. You will be provided with a copy of the assessment.

Pre-Course diagnostic testing.

A Pre-course diagnostic tool will be completed by each student on day one of the course. This is designed to assess the level of knowledge you have retained from your previous training and to highlight any weak areas you may have. It provides your instructor a clue as to where the level of training on this course should commence. The diagnostic tool will not count towards the overall course results. But, a very poor result could incur the raising of a Training Progress Report (TPR) by your instructor.

Problems.

Any problems, deficiencies or errors that are encountered during the course are to be brought to the attention of the instructor

Questions.

Do not hesitate to identify to the instructor any difficulties or general problems you have with the course content or structure

Information.

A CAI classroom will be made available for your use throughout the duration of the course

Trainee Manual.

The trainee manual is written for use within the MCC operator course. The trainee manual should be used in conjunction with the relevant system ABR's CAI and any other documentation issued during previous courses.

The Manual and other courseware developed for this course is not be referenced as authorised equipment manuals or official RAN publications.

References

ABR 5891	Manoeuvring Control System Subsystem Technical Manual
ABR 5812	Main Propulsion System Operator's Manual
ABR 5825	Emergency Propulsion Technical Equipment Manual
ABR 5889	ISCMMS Subsystem Manual
ABR 5967	Trim Subsystem Manual
ABR 5971	Weight Compensation and Buoyancy Subsystem Manual
AFTP 30 B	Submarine Operations Manual
ABR 6009	Emergency Operating Procedures
SSO's	Standard Operating Procedures (SOP's)

Course Critique.

A course critique will be provided to you by your instructor at the end of the course. Please take the time to complete it honestly. An envelope will be available for the QCO. If you feel that you require an interview with the QCO this can also be arranged for you.

Course Schedule.

The attached lesson schedule shows the flow of subjects

Course Schedule 1 - Week 1 (2 Students)

<table>
<tr><th>Session</th><th>Day 1</th><th>Day 2</th><th>Day 3</th><th>Day 4</th><th>Day 5</th></tr>
<tr><td>1</td><td>Course Introduction</td><td rowspan="2">Maintain Ordered Course and Depth</td><td rowspan="2">Trimming</td><td rowspan="2">UDC and RTPD</td><td rowspan="3">Consolidation for Student 1</td></tr>
<tr><td>2</td><td>Pre Course Test</td></tr>
<tr><td>3</td><td rowspan="2">Computer Based Training</td><td rowspan="2">Weight Comp</td><td rowspan="2">Manoeuvring System Failures</td></tr>
<tr><td>4</td><td>DSC Introduction</td></tr>
<tr><td>5</td><td>MCC Layout</td><td>DSC Introduction</td><td>Diving</td><td rowspan="2">Propulsion Failure</td><td rowspan="3">Consolidation for Student 2</td></tr>
<tr><td>6</td><td>Control Surface Theory</td><td rowspan="3">Propulsion Modes and the EPU</td><td rowspan="2">Maintain Submarine Control whilst Snorting</td></tr>
<tr><td>7</td><td rowspan="2">Control Surface Operations</td><td rowspan="2">Stop Trim</td></tr>
<tr><td>8</td><td>Surfacing</td></tr>
</table>

Course Schedule 2 - Week 2 (2 Students)

<table>
<tr><th>Session</th><th>Day 1</th><th>Day 2</th><th>Day 3</th><th>Day 4</th><th>Day 5</th></tr>
<tr><td>1</td><td>Emergency Stations</td><td rowspan="4">Hydraulic Burst and Failures</td><td rowspan="8">Consolidation / Freeplay</td><td rowspan="8">Consolidation / Freeplay</td><td rowspan="4">Course Evaluation and Wash up</td></tr>
<tr><td>2</td><td rowspan="3">Collision</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td><td rowspan="4">Grounding</td><td rowspan="2">High Speed Runs</td><td rowspan="4"></td></tr>
<tr><td>6</td></tr>
<tr><td>7</td><td rowspan="2">Flooding</td></tr>
<tr><td>8</td></tr>
</table>

Course Schedule 3 - Week 1 (3 Students)

<table>
<tr><th>Session</th><th>Day 1</th><th>Day 2</th><th>Day 3</th><th>Day 4</th><th>Day 5</th></tr>
<tr><td>1</td><td>Course Introduction</td><td>MCC Layout</td><td rowspan="2">Trimming</td><td rowspan="8">Maintain Submarine Control whilst Snorting</td><td rowspan="4">Consolidation / Freeplay</td></tr>
<tr><td>2</td><td>Pre Course Test</td><td rowspan="2">Control Surface Theory</td></tr>
<tr><td>3</td><td rowspan="6">Computer Based Training</td><td rowspan="2">Weight Comp</td></tr>
<tr><td>4</td><td rowspan="2">Control Surface Operations</td></tr>
<tr><td>5</td><td rowspan="3">DSC Introduction / Snorting from the DSC</td></tr>
<tr><td>6</td><td rowspan="3">Propulsion Modes and the EPU</td><td rowspan="3"></td></tr>
<tr><td>7</td></tr>
<tr><td>8</td><td>Consolidation / Freeplay</td></tr>
</table>

Course Schedule 4 - Week 2 (3 Students)

Session	Day 6	Day 7	Day 8	Day 9	Day 10
1	UDC / RTPD	Diving and Surfacing	Manoeuvring System Failures	Collision	Consolidation / Freeplay
2					
3					
4					
5	High Speed Runs	Maintain Submarine Control whilst Snorting	Emergency Stations	Hydraulic Burst and Failures	
6					
7					
8					

Course Schedule 5 - Week 3 (3 Students)

<table>
<tr><th>Session</th><th>Day 11</th><th>Day 12</th><th>Day 13</th><th>Day 14</th><th>Day 15</th></tr>
<tr><td>1</td><td rowspan="4">Grounding</td><td rowspan="8">Consolidation / Freeplay</td><td rowspan="8">Consolidation / Freeplay</td><td rowspan="8">Mastery Tests</td><td rowspan="4">Course Evaluation and Wash up</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td><td rowspan="4">Flooding</td><td rowspan="4"></td></tr>
<tr><td>6</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td></tr>
</table>

ABR 6009 / SSO's.

EOPs and SOPs represent the general basis of instruction for MCC course students. As such, total familiarity with these procedures is required as soon as possible.

100358 – Manoeuvring Control Console – Learning Outcomes

On completion of this course you will have the competence to operate the MCC dived in the Submarine Control Simulator (SCS)

The course consists of the following Module Learning Outcomes (MLO) and Assessment Criteria (AC)

- **MLO 1 Describe the MCC Layout**
  - AC 1.1 Identify the MCC Layout
  - AC 1.2 Describe the MCC Layout
  - AC 1.3 Manipulate the Manoeuvring Zones
  - AC 1.4 Conduct a MCC Handover

- **MLO 2 Operate the Control Surfaces**
  - AC 2.1 Describe the operation of the Control Surfaces
  - AC 2.2 Demonstrate the operation of the Control Surfaces
  - AC 2.3 Operate the MCC to achieve and maintain ordered Heading and Depth in the following modes:

    - Steering Mode Normal, Heading and Depth Mode Auto
    - Steering Mode Normal, Depth Mode Manual-Separate
    - Steering Mode Normal, Depth Mode Manual-Combined
    - Steering Mode Normal, Heading Mode Manual
    - Emergency Mode 1
    - Emergency Mode 2

- **MLO 3 Operate the Propulsion System at the MCC**

  AC 3.1 Operate the propulsion system from the MCC in:

  Auto 1

  Auto 2

  Manual

  AC 3.2 Manoeuvre the SM from the MCC using the Emergency Propulsion Unit (EPU)

- **MLO 4 Operate the Trim System**

  AC 4.1 Conduct Trimming in Normal mode

  AC 4.2 Conduct Trimming in Emergency mode

- **MLO 5 Operate the Weight Compensation System**

  AC 5.1 Conduct Weight Compensation in Normal mode

  AC 5.2 Conduct Weight Compensation in Emergency Mode

  AC 5.3 Catch a Stop Trim at the MCC

- **MLO 6 Maintain and alter depth and heading as ordered whilst responding to SSO's and EOP's**

  AC 6.1 Dive the Submarine

  AC 6.2 Surface the Submarine

  AC 6.3 Return to Periscope Depth

  AC 6.4 Conduct an Urgent Depth Change (UDC)

  AC 6.5 Respond to Manoeuvring System Failures

  AC 6.6 Respond to a Propulsion Failure

  AC 6.7 Respond to a Collision – Dived

  AC 6.8 Respond to a Grounding – Dived

  AC 6.9 Respond to a Flood (Emergency Surface)

  AC 6.10 Respond to Hydraulic System Bursts and Failures

Conning Orders

Heading Control

Heading Auto Mode – Surfaced / Dived

OOW	"PORT/STBD Wheel, Steer _____" (Course)
MCC	"PORT/STBD Wheel, Steer _____" (Course)
MCC	*enters course into MCC*
MCC	"10 Degrees to course, Sir"
MCC	"On Course _____, Sir"

Note: Standard wheel is 15 degrees and is used for planning purposes. Cardinal compass points are to be called (e.g. "Passing through North/South/East/West").

Dived – Heading Mode Manual / Emergency Steering Mode

The following orders are to be used whilst dived and in Manual/Emergency modes of operation;

OOW	"PORT/STBD Wheel, Steer ____" (Course)
MCC	"PORT/STBD Wheel, Steer ____" (Course)
MCC	*enters course into MCC*
MCC	"PORT/STBD wheel on Sir"
MCC	"10 degrees to course, Sir"
MCC	"On Course ____, Sir"

s33(a)(ii)

Depth Control

Depth Mode Auto

The following orders are to be used when in Depth mode Auto:

OOW	"Keep *** metres" (depth in Metres)
MCC	"Keep *** metres" (depth in Metres)
MCC	enters the ordered depth into the MCC
MCC	"On Depth *** metres, Sir"

Depth mode Manual (Separate or combined) / Emergency modes Depth Control

The following orders are to be used when in Manual/Emergency depth control mode:

OOW	___ ° down / up "Keep *** metres" (depth in Metres)
MCC	___ ° down / up "Keep *** metres" (depth in Metres)
MCC	calls angle and depth
MCC	enters the ordered depth into the MCC
MCC	"On Depth *** metres, Sir"

s33(a)(ii)

Depth and Angle calling

The following reports will be made by the MCC operator in response to depth and angle calling

s33(a)(ii)

Setting Depth Zones

When a requirement exists to change depth zones, the following orders are to be used:

OOW	"Set Upper/Lower Depth Zone to *** metres"
MCC	"Set Upper/Lower Depth Zone to *** metres"
MCC	operator enters the required change into ISCMMS Page 203
MCC	"Upper/Lower Depth Zone set to *** metres, Sir"

Changing Heading Control States

Heading Mode Auto / Manual

OOW	"Select Heading Mode Auto/Manual"
MCC	"Select Heading Mode Auto/Manual"
MCC	operator selects the required Mode.
MCC	"Heading Mode Auto/Manual Selected"

Steering Mode Emergency 1 or 2

To select an emergency mode of operation the following order is to be used:

OOW "Select Emergency Mode 1 or 2"
MCC "Select Emergency Mode 1 or 2"
MCC operator selects the required Mode.
MCC "Emergency Mode 1 or 2 Selected"

Reverting from Steering Mode Emergency 1 to Steering Mode Normal

To revert from an emergency mode to Steering mode normal the following order is to be used:

OOW "Select Steering Mode Normal"
MCC "Select Steering Mode Normal"
MCC "Steering Mode Normal selected"

This is then followed by an Auto/Manual Mode order.

Propulsion

Increasing / Decreasing Main Motor Revolutions

OOW "Ahead/Astern Revolutions ******"
MCC "Ahead/Astern Revolutions ******"
MCC "Ahead/Astern Revolutions ****** Ordered"

Once revolutions start increasing / decreasing:

MCC "Revolutions Increasing/Decreasing, Sir"

When the ordered revolutions are set:

MCC "Ahead/Astern Revolutions ****** Set, Sir"

Stopping Main Motor

OOW "Stop Main Motor"
MCC "Stop Main Motor"
MCC "Stop Main Motor ordered, Sir"

Once Main Motor light is extinguished on Speed Selector report:

MCC "Main Motor Stopped"

Calling Log Speed

When revolutions are changed there is a requirement to report to the OOW / WL the submarines 'speed by log'. The requirement is as follows:

a. *Speed increasing - every 1 knot*

b. *Speed decreasing - every 1 knot*

c. *When astern revolutions are ordered - every 0.5 of a knot.*

s33(a)(ii)

Changing Propulsion Control States

Note: Main motor must be **STOPPED** prior to altering control state.

MCC	"Main Motor Stopped"
OOW	"Propulsion in Auto/Manual Control"
MCC	"Propulsion in Auto/Manual Control"
DSC - PCC	"Propulsion in Auto/Manual Control"

When the PCC has reconfigured the propulsion system and reported to the DSC:

MCC - OOW	"Propulsion ready in Auto/Manual Control. Zero revolutions set"

Miscellaneous Conning Orders

The following miscellaneous orders are promulgated for use:

Midships

OOW "MIDSHIPS"

The MCC operator will centre the control surfaces in heading only. Depth and pitch ordered should be maintained.

MCC "Wheel AMIDSHIPS Sir."

The OOW will then give further conning orders e.g. "Steer ***" (Course)

Steady

OOW "STEADY"

The MCC operator will report as below and steer course called in heading only, depth and pitch ordered should be maintained.

MCC "STEADY, Ships Head ***" (in Degrees)

Weight Compensation and Trim

s33(a)(ii)

Calling Weight Comp

Weight Compensation and Trim systems:

SCOOW "Catch a trim at this speed"

MCC "Catch a trim at this speed, MCC aye"

"SCOOW MCC, happy with Trim and Weight Comp at this speed"

WEIGHT COMPENSATION

Pumping

s33(a)(ii)

s33(a)(ii)

TRIM

Trimming

s33(a)(ii)

NOTE

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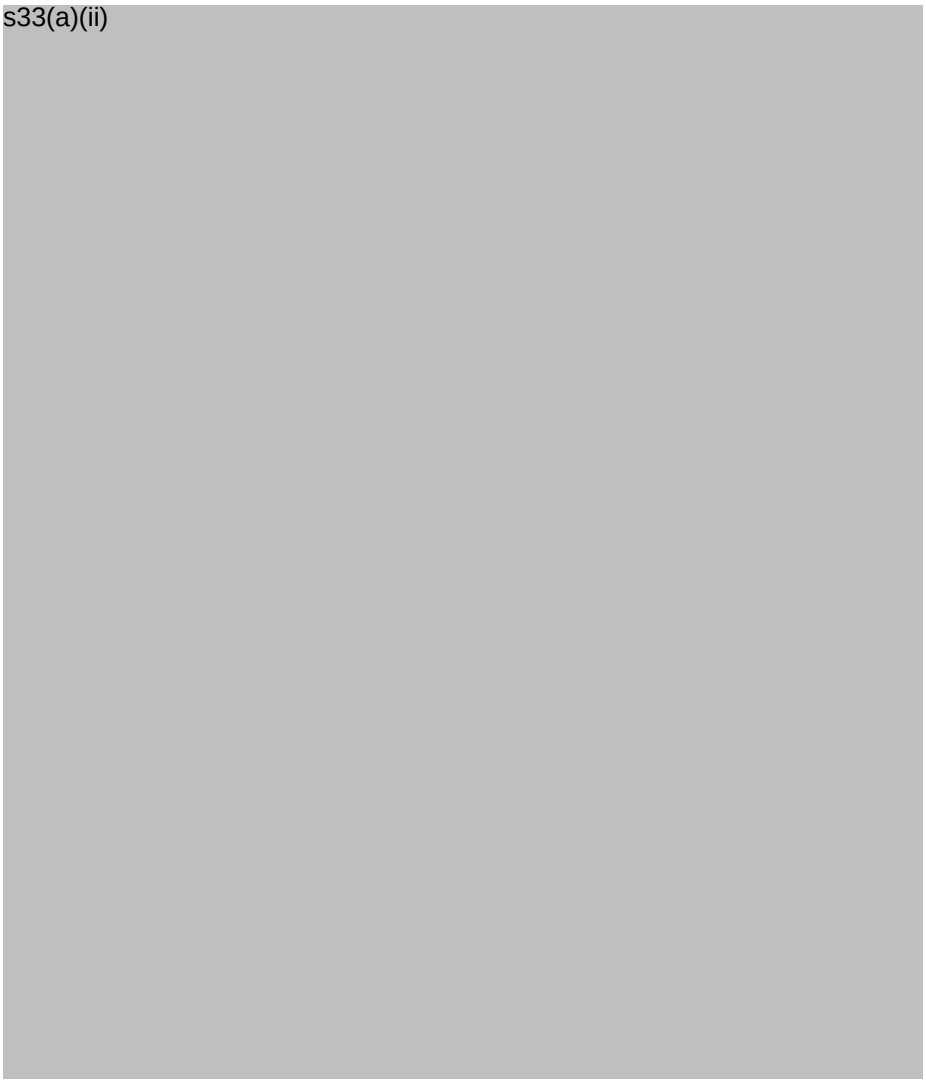

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TRAINING MANAGEMENT PACKAGE

TRAINEE MANUAL

CCSM Maneuvering Control Console

100358

Date of Issue: 29 April 2019

Training Development Authority: OIC TSG

Conduct of Training Authority: Manager Engineering Training

Version Control Data

Title:	**CCSM Manoeuvring Control Console**
Responsibility:	Senior Instructor - Simulator
Approver and date:	OIC TSG – 16 April 2019
Version number:	v2.0_04_2019
Next review due:	May 2021

Document History

Version	Date	Status	Author	CDCP	Short Description of changes
v1.0_07_2013	Jul13	Superseded	s47E(d)	0712	Reformatted into new template Changes made iaw QC report 29Aug12
v1.1_09_2014	Sep14	Superseded	s47E(d)	0972	Changes to propulsion orders iaw AFTP 30 B page 20
v2.0_04_2019	29Apr19	Active	s47E(d	1458	Updated diagrams and matched to reference AFTP 30 B

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Conditions of Release

References:

A. Defence Security Manual.

B. DI (G) OPS 13-4 *Release of Classified Defence Information to Other Countries*.

This work contains valuable Australian Defence information. In accordance with the references above the following minimum conditions of release apply:

- The Training Management Package is not to be used for any purpose other than Australian military training without written authorisation from the Training Authority – Submarines or their nominated delegate.
- Security handling and storage commensurate with the classification of the Training Management Package are to be observed in accordance with the Defence Security Manual.
- The security classification indicated on the cover applies to all parts of this document. The classification cannot be downgraded without the relevant Training Advisor's approval.
- The contents are not to be divulged to non-Defence organisations, including other Commonwealth Agencies, or individuals unless authorised in writing by the Training Authority – Submarines or their nominated delegate.
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WARNING

This document is a training aid only. It does not replace any reference materials or equipment nor is it intended as a technical manual.

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General Information

Course Length.

10 days for 2 students

15 days for 3 students

Aim.

On completion of this course you will have the competence to operate the Manoeuvring Control console in the Submarine Control Simulator and be ready to proceed to the sea training phase.

Course Structure.

The course comprises of Computer Aided Instruction (CAI), Instructor led lessons and Simulator training. Where possible each lesson or section will start with an instructor led introduction. This will then be reinforced by a simulator session followed by an instructor led debriefing in the classroom.

Course times.

Day Shift	0745 – 1600
Afternoon Shift	1600 – 2359
OR	
(1st Shift)	0700 – 1500
(2nd Shift)	1300 – 1900
(3rd Shift)	1700 - 0100

Assessment.

The assessment for this course is conducted in a “Rolling Assessment” format through the use of a Practical Assessment Record (PAR). Assessment will be ongoing throughout the course with the final assessment being recorded as “Achieved” or “Not Achieved”. You will be provided with a copy of the assessment.

Pre-Course diagnostic testing.

A Pre-course diagnostic tool will be completed by each student on day one of the course. This is designed to assess the level of knowledge you have retained from your previous training and to highlight any weak areas you may have. It provides your instructor a clue as to where the level of training on this course should commence. The diagnostic tool will not count towards the overall course results. But, a very poor result could incur the raising of a Training Progress Report (TPR) by your instructor.

Problems.

Any problems, deficiencies or errors that are encountered during the course are to be brought to the attention of the instructor

Questions.

Do not hesitate to identify to the instructor any difficulties or general problems you have with the course content or structure

Information.

A CAI classroom will be made available for your use throughout the duration of the course

Trainee Manual.

The trainee manual is written for use within the MCC operator course. The trainee manual should be used in conjunction with the relevant system ABR's CAI and any other documentation issued during previous courses.

The Manual and other courseware developed for this course is not be referenced as authorised equipment manuals or official RAN publications.

References

ABR 5891	Manoeuvring Control System Subsystem Technical Manual
ABR 5812	Main Propulsion System Operator's Manual
ABR 5825	Emergency Propulsion Technical Equipment Manual
ABR 5889	ISCMMS Subsystem Manual
ABR 5967	Trim Subsystem Manual
ABR 5971	Weight Compensation and Buoyancy Subsystem Manual
AFTP 30 B	Submarine Operations Manual
ABR 6009	Emergency Operating Procedures
SSO's	Standard Operating Procedures (SOP's)

Training Review Survey.

An online Training Review Survey log in sheet will be provided by your instructor at the end of the course. Please take the time to complete the survey as your feedback will assist Training Force in implementing course improvements. If you feel that you require an interview with the Training Evaluation Office this can also be arranged through your instructor.

Course Schedule.

The following lesson schedule shows the flow of subjects

Course Schedule 1 - Week 1 (2 Students) need to redo all

Session	Day 1	Day 2	Day 3	Day 4	Day 5
1	Course Introduction	Propulsion Modes and EPU Maintain Ordered Course and Depth	UDC and RTPD	Manoeuvring System Failures	Consolidation
2	Pre Course Test				
3	Computer Based Training		DSC Introduction Maintain Submarine Control whilst Snorting	Slow Speed Planning	
4					
5	Control Surface Theory	Trim	UDC Whilst Snorting	Propulsion Failure High Speed Planning	Consolidation
6	MCC Layout	Weight Comp	Diving and Surfacing		
7	Control Surface Operations			Stop Trim	
8					

Course Schedule 2 - Week 2 (2 Students)

Session	Day 1	Day 2	Day 3	Day 4	Day 5
1	Emergency Stations	Hydraulic Burst and Failures	Consolidation	Consolidation	Course Evaluation and Wash up
2	Collision				
3					
4					
5	Grounding	Flooding			
6					
7					
8					

Course Schedule 3 - Week 1 (3 Students)

Session	Day 1	Day 2	Day 3	Day 4	Day 5
1	Course Introduction	MCC Layout	Trimming	Maintain Submarine Control whilst Snorting	Consolidation
2	Pre Course Test	Control Surface Theory			
3	Computer Based Training		Weight Comp		
4		Control Surface Operations			
5			DSC Introduction / Snorting from the DSC		
6		Propulsion Modes and the EPU			
7					
8			Consolidation		

Course Schedule 4 - Week 2 (3 Students)

Session	Day 6	Day 7	Day 8	Day 9	Day 10
1	UDC / RTPD	Diving and Surfacing	Manoeuvring System Failures	Collision	Consolidation
2					
3					
4					
5	High Speed Runs	Maintain Submarine Control whilst Snorting	Emergency Stations	Hydraulic Burst and Failures	
6					
7					
8					

Course Schedule 5 - Week 3 (3 Students)

<table>
<tr><th>Session</th><th>Day 11</th><th>Day 12</th><th>Day 13</th><th>Day 14</th><th>Day 15</th></tr>
<tr><td>1</td><td rowspan="4">Grounding</td><td rowspan="8">Consolidation</td><td rowspan="8">Consolidation</td><td rowspan="8">Consolidation</td><td rowspan="4">Course Evaluation and Wash up</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td><td rowspan="4">Flooding</td><td rowspan="4"></td></tr>
<tr><td>6</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td></tr>
</table>

ABR 6009 / SSO's.

EOPs and SOPs represent the general basis of instruction for MCC course students. As such, total familiarity with these procedures is required as soon as possible.

100358 – Manoeuvring Control Console – Learning Outcomes

On completion of this course you will have the competence to operate the MCC dived in the Submarine Control Simulator (SCS)

The course consists of the following Module Learning Outcomes (MLO) and Assessment Criteria (AC)

- **MLO 1 Describe the MCC Layout**
  - AC 1.1 Identify the MCC Layout
  - AC 1.2 Describe the MCC Layout
  - AC 1.3 Manipulate Page 201 / 202 / 203 the Manoeuvring Zones
  - AC 1.4 Conduct a MCC Handover

- **MLO 2 Operate the Control Surfaces**
  - AC 2.1 Describe the operation of the Control Surfaces and Hydroplane
  - AC 2.2 Demonstrate the operation of the Control Surfaces and Hydroplane
  - AC 2.3 Operate the MCC to achieve and maintain ordered Heading and Depth in the following modes:
    - Steering Mode Normal, Heading and Depth Mode Auto
    - Steering Mode Normal, Depth Mode Manual-Separate
    - Steering Mode Normal, Depth Mode Manual-Combined
    - Steering Mode Normal, Heading Mode Manual
    - Emergency Mode 1
    - Emergency Mode 2

- **MLO 3 Operate the Propulsion System at the MCC**

  AC 3.1 Operate the propulsion system from the MCC in:
  Auto 1

  Auto 2

  Manual

  AC 3.2 Manoeuvre the SM from the MCC using the Emergency Propulsion Unit (EPU)

- **MLO 4 Operate the Trim System**

  AC 4.1 Conduct Trimming in Normal mode

  AC 4.2 Conduct Trimming in Emergency mode

- **MLO 5 Operate the Weight Compensation System**

  AC 5.1 Conduct Weight Compensation in Normal mode

  AC 5.2 Conduct Weight Compensation in Emergency Mode

  AC 5.3 Catch a Stop Trim at the MCC

- **MLO 6 Maintain and alter depth and heading as ordered whilst responding to SOP's and EOP's**

  AC 6.1 Dive the Submarine

  AC 6.2 Surface the Submarine

  AC 6.3 Return to Periscope Depth

  AC 6.4 Conduct a Two Diesel Snort

  AC 6.5 Conduct an Urgent Depth Change (UDC)

  AC 6.6 Respond to Manoeuvring System Failures

  AC 6.7 Respond to a Propulsion Failure

  AC 6.8 Respond to a Collision – Dived

  AC 6.9 Respond to a Grounding – Dived

  AC 6.10 Respond to a Flood (Emergency Surface)

  AC 6.11 Respond to Int Hydraulic System Bursts and Failures

AC 6.12 Respond to Ext Hydraulic System Bursts and Failures

Conning Orders

Heading Control

Heading Mode Auto – Surfaced / Dived

OOW	"PORT/STBD Wheel, Steer _____" (Course)
MCC	"PORT/STBD Wheel, Steer _____" (Course)
MCC	*enters course into MCC*
MCC	"10 Degrees to course, Sir"
MCC	"On Course _____, Sir"

Note: Standard wheel is 15 degrees and is used for planning purposes. Cardinal compass points are to be called as "Passing through North/South/East/West".

Dived – Heading Mode Manual / Emergency Steering Mode

The following orders are to be used whilst Dived and in Manual/Emergency modes of operation;

OOW	"PORT/STBD Wheel, Steer ____" (Course)
MCC	"PORT/STBD Wheel, Steer ____" (Course)
MCC	*enters course into MCC*
MCC	"PORT/STBD wheel on Sir"
MCC	"10 degrees to course, Sir"
MCC	"On Course ____, Sir"

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Depth Control

Depth Mode Auto

The following orders are to be used when in Depth mode Auto:

OOW	"Keep *** metres" (depth in Metres)
MCC	"Keep *** metres" (depth in Metres)
MCC	enters the ordered depth into the MCC
MCC	"On Depth *** metres, Sir"

Depth mode Manual (Separate or combined) / Emergency modes Depth Control

The following orders are to be used when in Manual/Emergency depth control mode:

OOW	___° down / up "Keep *** metres" (depth in Metres)
MCC	___° down / up "Keep *** metres" (depth in Metres)
MCC	calls angle and depth
MCC	enters the ordered depth into the MCC
MCC	"On Depth *** metres, Sir"

s33(a)(ii)

Depth and Angle calling

s33(a)(ii)

- MCC operator will include pitch angles and depth rate when calling depths

Setting Depth Zones

When a requirement exists to change depth zones, the following orders are to be used:

OOW	"Set Upper/Lower Depth Zone to *** metres"
MCC	"Set Upper/Lower Depth Zone to *** metres"
MCC	enter the required change into ISCMMS Page 203
MCC	"Upper/Lower Depth Zone set to *** metres, Sir"

Changing Heading Control States

Heading Mode Auto / Manual

OOW	"Select Heading Mode Auto/Manual"
MCC	"Select Heading Mode Auto/Manual"
MCC	operator selects the required Mode.
MCC	"Heading Mode Auto/Manual Selected"

Steering Mode Emergency 1 or 2

To select an Emergency mode of operation the following order is to be used:

OOW "Select Emergency Mode 1 or 2"
MCC "Select Emergency Mode 1 or 2"
MCC operator selects the required Mode.
MCC "Emergency Mode 1 or 2 Selected"

Reverting from Emergency Steering Mode to Steering Mode Normal

To revert from Emergency Steering mode to Normal Steering mode the following order is to be used:

OOW "Select Steering Mode Normal"
MCC "Select Steering Mode Normal"
MCC "Steering Mode Normal selected"

This is then followed by a Normal Steering Auto/Manual Mode order.

Propulsion

Increasing / Decreasing Main Motor Revolutions

OOW "Ahead/Astern Revolutions ******"
MCC "Ahead/Astern Revolutions ******"
MCC "Ahead/Astern Revolutions ****** Ordered"

Once revolutions start increasing / decreasing:

MCC "Revolutions Increasing/Decreasing, Sir"

When the ordered revolutions are set:

CC "Ahead/Astern Revolutions ****** Set, Sir"

Stopping Main Motor

OOW "Stop Main Motor"
MCC "Stop Main Motor"
MCC "Stop Main Motor ordered, Revolutions Decreasing Speed by log"

Once Main Motor light is extinguished on Speed Selector report:

MCC "Main Motor Stopped" (Continue to call Speed by Log)

Calling Log Speed

When revolutions are changed there is a requirement to report to the OOW / WL the submarines 'speed by log'. The requirement is as follows:

a. *Speed decreasing - every 1 knot down to 2 knots then every 0.5 of a knot*

b. *When astern revolutions are ordered - every 0.5 of a knot Astern.*

s33(a)(ii)

Changing Propulsion Control States

Note: Main motor must be ORDERED **STOPPED** prior to altering control state.

OOW	"Stop Main Motor"
MCC	"Stop Main Motor"
MCC	"Stop Main Motor ordered
MCC	"Main Motor Stopped"
OOW	"Propulsion in Auto Manual Control"
DSC - PCC	"Propulsion in Auto/Manual Control"

When the PCC has reconfigured the propulsion system and reported to the DSC:

Auto

MCC - OOW "Propulsion ready in Auto Control"

Manual

MCC - OOW "Propulsion ready in Manual Control. Zero revolutions set"

Note: If the speed selector is/is not required in Auto Control the order "Enable / Disable the speed selector" is given once the propulsion system is in the required configuration.

Miscellaneous Conning Orders

The following miscellaneous orders are promulgated for use:
Midships

OOW "MIDSHIPS"

On this order the MCC operator will centre the control surfaces **in heading only**. Ordered Depth and pitch should be maintained.

MCC "Wheel AMIDSHIPS ships head ***" Sir." (continually call Ships Head ***" in Degrees)

The OOW will then give further conning orders e.g. "Steer ***" (Course)
Steady

OOW "STEADY"

The MCC operator will report and steer course called in **heading only**, ordered depth and pitch should be maintained.

MCC "STEADY, Ships Head ***" (in Degrees)

MCC Signal Flow Diagram

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Figure 1 – MCC Signal Flow

MCC Signal Flow Descriptors

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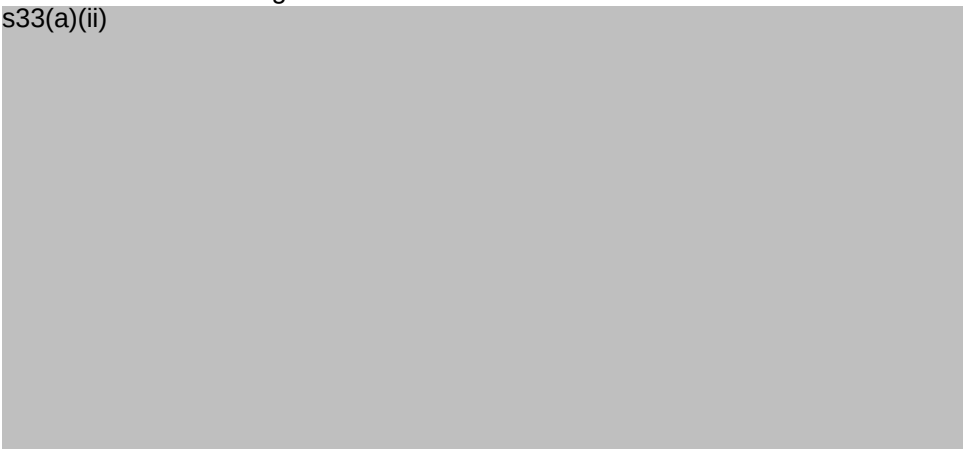
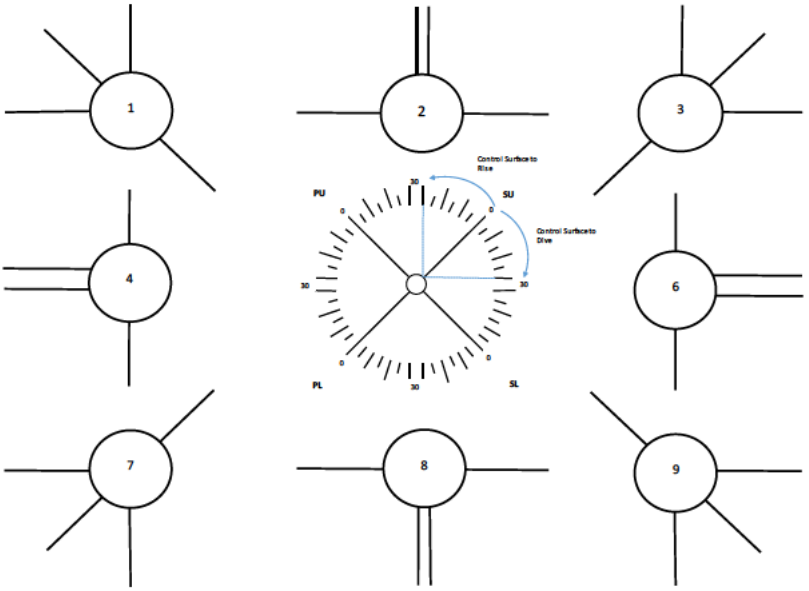


Notes

Control Surface Movement



1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

7. _____ 8. _____ 9. _____

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Figure 2 - Control Surfaces

Normal Steering Mode

The primary tasks of the MCC are to maintain heading and depth. Within Normal Steering Mode there are two sub modes – Heading mode and Depth mode. The flow chart below describes these sub modes.

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Figure 3 - Normal Steering Mode

Emergency Steering Mode

Emergency Steering Mode at the MCC bypasses the MCC computers and provides the ability to maintain heading and depth at the MCC in two sub modes.

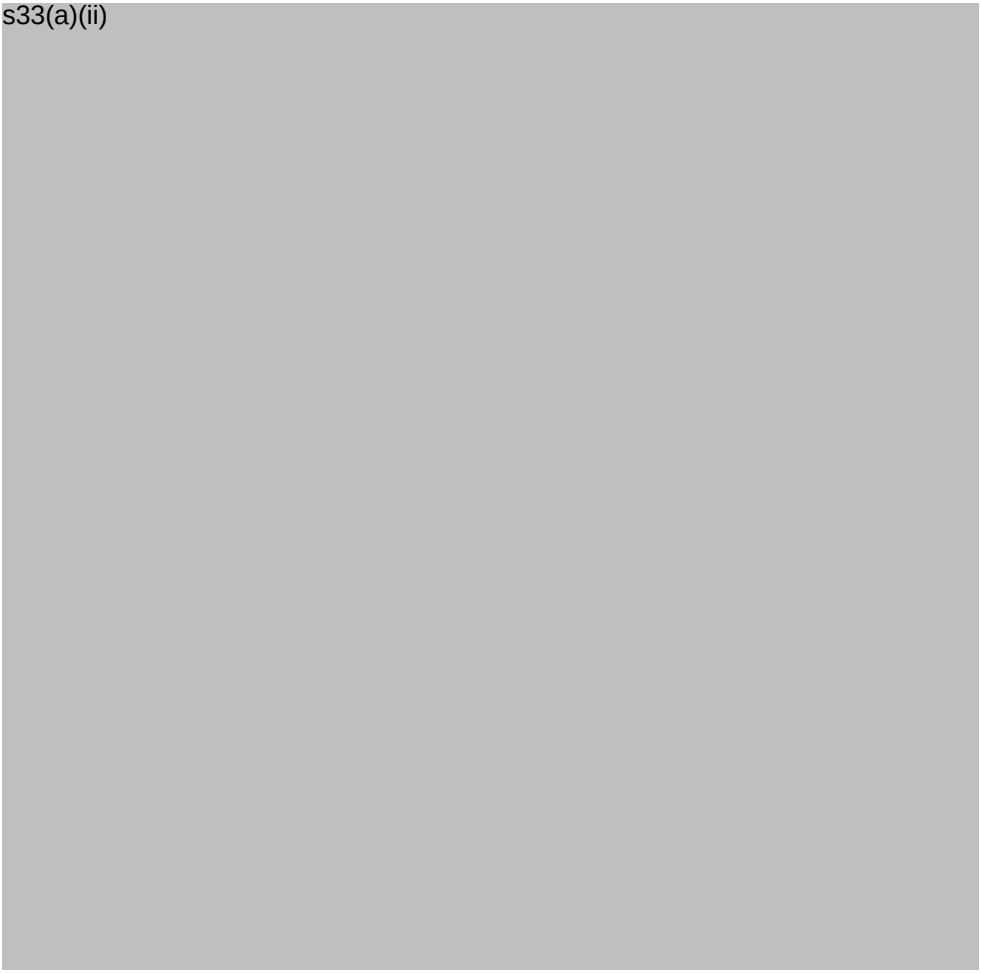

Figure 4 - Emergency Modes

Propulsion

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Figure 5 - Propulsion Modes

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Figure 6 – Speed Groups

Notes

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Calling Weight Comp

Weight Compensation and Trim systems:

SCOOW "MCC Catch a trim at this speed"

MCC "Catch a trim at this speed, MCC aye"

"SCOOW MCC, happy with Trim and Weight Comp at this speed"

WEIGHT COMPENSATION

Pumping

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Flooding

s33(a)(ii)

TRIM

Trimming

s33(a)(ii)

Notes

Notes

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