HM Coastguard

# Coastguard Programme

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| **COURSE** | MOO PROGRAMME |

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| **MODULE** | F |

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|---|---|
| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 1.1 |
| **SESSION NAME** | Introduction |

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| **SCHEDULED SESSION TIME** | 00:20 |

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| **RESOURCES NEEDED** | **SARIS SUITE**<br>**PAPER**<br>**PENS** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | To welcome students to the Training Centre and to introduce them to the course so that they are able to learn and refresh search planning techniques in a safe environment. |
| **Learning Outcomes** | |
| **Key Learning Points** | Domestic briefing.<br>Outline the aims and objectives of this course.<br>Restate the reason for search planning and the importance of SP skills.<br>Outline the elements to be covered and an approximate time scale.<br>Reinforce the view that this is not a 'button pushing' course but this is the 'thinking person's SP course'. It is up to the search planner to make important decisions on values to be used in any SP model.<br>The equipment SARIS is a tool which is useless without a sound understanding of the background principles.<br>Allow students to express their own learning objectives. |

## Session 1.1: Introduction

**Explain**

Site layout, toilet facilities, health and safety, smoking facilities, fire alarm and drill.

The format of the course is 5 days of training covering both the manual and electronic elements of search planning.
We will be covering;
Manual SAD
Interpolation
Manual SAC
SARIS
RR in SARIS
Notes to put into SARIS
Extending a datum time
Mid search compromise/ mid search time
DP in SARIS
SAC in SARIS
SAD to SAC in SARIS
Passing search instructions
DL in SARIS
BT in SARIS
SARIS report analysis
Adding additional vessels to a SAC plan in SARIS

**ASK**

**What would you like to cover this week that is not on the programme?**

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 1.2 |
| **SESSION NAME** | SAD Revision |

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| **SCHEDULED SESSION TIME** | 02:00 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Parallel Rules**<br>**Dividers**<br>**2b Pencils**<br>**SAD Worksheets**<br>**Tidal Vector Worksheets**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Refresh all elements of Search Area Determination with particular reference to the RR search model. To introduce the concept of "Intelligent" SP, especially in the selection of drift data. |
| **Learning Outcomes** | Delegates will be able to carry out SAD manually and remember the key principles in order to be able to plan searches on SARIS. |

| Key Learning Points | |
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## Session 1.2: SAD Revision

**Explain**

**The rapid response model considering each drift element in turn (tidal currents and leeway). Initially with the DSP and the LKP being the same. Then, introduce the DSP being a DR position – consider the implications and occasions when this may be used (always in a DL model).**

**Introduce (only) the concept of WDC and divergence and why it is not used in this model.**

**ASK**

**Where can environmental drift information be obtained?**

**TIDES – tidal diamonds, tidal atlas, SARIS, almanacs, internet...**
**WIND – forecast, ARCC, internet, local observers and casualty. Pros and Cons of each. Import of data from Met Office.**

**Explain**

**Plotting construction on the chart with correct annotation and abbreviations to achieve a datum position. Consideration of the accuracy of the; IP, DSP, tidal data and wind speed/direction, leeway formula used.**

**Explain how these are accounted for in terms of DRe, IPE and De. Consider the normal values and possible modifications.**

**Talk through TVW and SAD forms. Discuss the dangers of rounding figures too soon. Plot on chart to achieve a search area.**

**Undertake a number of manual RR exercises (these will be used later for SARIS comparison)**

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 1.3 |
| **SESSION NAME** | Interpolation |

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| **SCHEDULED SESSION TIME** | 00:15 |

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| **RESOURCES NEEDED** | **Whiteboard**<br>**SAR G+T**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Refresh ladder method of interpolation. |
| **Learning Outcomes** | Delegates will be able to interpolate effectively in order to be able to adjust figures for SAC. |
| **Key Learning Points** | |

## Session 1.3: Interpolation

**Explain**

When in the SAC phase we may need to interpolate the figures which are in SAR G+T for visibility or aircraft speed to obtain the most accurate figures to take forward.

The ladder method is a really simple way of doing this but if you have your own method that works for you then use it.

**ASK**

What the uncorrected sweep width for a 38ft MFV SRU Helo flying at 1000ft vis 10mn and 15nm?

10nm 6.3
15nm 7.9

**ASK**

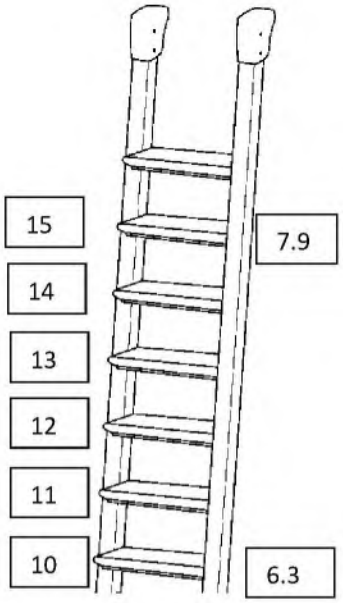
What if the visibility is 13nm?

**Explain**

**You have learnt the Crocodile Teeth method from your RYA yachtmaster but there is another method should you wish to try it.**

We carry out the ladder method of interpolation as follows;

If interpolating visibility put the smaller figure on the lowest rung e.g. 6.3 on the '10$^{th'}$ (for 10nm vis) and then the larger figure 7.9 on the '15$^{th'}$ (for 15nm vis) rung. Imagine that on the 10$^{th}$ rung you are 6.3m off the ground and at the 15$^{th}$ rung you will be 7.9m off the ground, just to spell it out in literal terms. Count the number of rungs to climb from the 10$^{th}$ to the 15$^{th}$ = 5. Divide the number of rungs by the 'height' difference. 1.6/5=0.32 which means each rung has a 'height' gain of 0.32m. 13nm = 7.26




Now add the 0.43 on to the 10th rung and this will give you the height of the 11th and so on until you find the rung (visibility) you desire.

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| **SESSION NUMBER** | 1.4 |
| **SESSION NAME** | SAC Revision |

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| **SCHEDULED SESSION TIME** | 02:20 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**SAC Worksheets**<br>**Exercises**<br>**Calculators**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Refresh the manual SAC calculation. |
| **Learning Outcomes** | Delegates will be able to allocate a single or a number of similar search units to a search area and be able to gauge the effectiveness of their actions by manipulation of the A=VNST formula.<br><br>They will also understand the relationships between the formula elements. |
| **Key Learning Points** | |

## Session 1.4: SAC Revision

**Explain**

The A=VNST formula, the individual elements and the relationship between them. Delegates must understand that if one element is changed, it will have an effect on all other elements. Note that EST = OSE x 0.85 – explain. In essence it is a more complex Distance=Speed/Time formula.

**Explain**

Explain and practice the extraction of the uncorrected sweep width and then applying the corrections to find Wc. (speed if aircraft, weather and fatigue corrections). Weather, speed and fatigue corrections to be explained in detail and when they should be applied. Interpolation is appropriate for speed correction and visibility only, you should go to the nearest applicable altitude for heights.

**Explain**

Corrected sweep width, Track Spacing, Coverage Factor and POD and the relationship between them.

Talk through the SAC form. Explain all sections but particularly section G, emphasising that this is a practical form for operational use. The form is not complete until an achievable value of S has been derived.

**Activity**

Delegates to carry out a number of SAC exercises. Their individual results to be checked on completion. Discuss variations in the final chosen value of S

**Explain**

Day and night detection aids, using SAR G+T, talk through the options available in both lists. Explain how the values are Wc and do not require any modification, with the exception of green dye and orange smoke. Night time detection aids are a different list and the Wc values are applicable to night time use. Electronic Aids. Discuss values of Wc for a RADAR detection aid – only available option in SARIS. Emphasise that the values displayed in SARIS are theoretical values and should be used with caution. Consider the target.

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| **SESSION NUMBER** | 1.5 |
| **SESSION NAME** | SARIS Intro 1 |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Introduction to SARIS. |
| **Learning Outcomes** | Enable delegates to open the SARIS program, to have an understanding of the menu items and buttons prior to completing a search model. |
| **Key Learning Points** | |

## Session 1.5: SARIS Intro 1

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

### Explain

How to open SARIS program - r/click and open, we do this because SARIS takes time to load and it may not look like it has responded to a double click and you may end up opening SARIS multiple times.

SARIS 4 has a similar layout to Windows 8. The top toolbars have the following tabs; Home, Exchange, Met Ocean, GIS, Tools, Models, Tools, Model, AIS and SARIS.

Talk through each of the tabs explaining the associated actions.

**Home;** Print, Print Preview

**Exchange;** Importing NETCDF files, GRIB files – NOT CURRENTLY USED

**Met Ocean;** View currents, view winds, profile (which gives direction and rate for a given position), current time series (gives direction and rate for given position over a selected time period), calendar (gives direction and rate of a given position for a month in hourly intervals), DO NOT TOUCH Current manager, Wind manager, Ports or Diamonds.

**GIS;** General Information System, all self-explanatory DO NOT TOUCH – Set Projection.

**Tools;** ONLY GO INTO SARIS TAB TO TOGGLE ON/OFF SAC LEG DETAILS & ABOUT VMIS FOR PDF USER GUIDE. The reason for this is that you can change all of the way in which units are measured for example you can change altitude from feet to meters!

**Models;** all self-explanatory, we will not use xml report as AIS will feed into SARIS and we will not use spreadsheet.

**AIS;**

**SARIS;** Extend datum time, proceed to SAC, clear SAC, generate probability overlay

In particular delegates must be able to –

- Display/Hide tidal vectors.
- Configure tidal vectors; range of speeds and spread of colours
- Be able to override the currents
- Load and unload charts using the management side bar
- Save and display a chart view

- Extract tidal data information
- Zoom and reposition the chart display
- Use the measuring tool for direction and bearing
- Have an understanding of the model control buttons

Using the side bars, delegates must also be able to turn on/off various display options.

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| **UNIT NUMBER** | 03 |
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| **SESSION NUMBER** | 1.6 |
| **SESSION NAME** | SARIS Intro 2 |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | An introduction to the right hand click functions in SARIS in preparation for use later on in the course. |
| **Learning Outcomes** | To have an understanding of the right hand click menu items and buttons prior to completing a search model. |
| **Key Learning Points** | |

## Session 1.6: SARIS Intro 2

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

### Explain

Demonstrate, for each of the following, the function and explain where and when they will be of use in general search planning or in search model creation.

Incident location (datum point)
Incident location (datum line)
Found location (backtrack)
Draw Search area
Manipulate search area
Manipulate sub-area
Define route plan

For each of the following, demonstrate the function and explain where and when they will be of use in general search planning or in search model creation.

Chart Loader
Zoom controls
GIS query
Centre chart
Measure
Place marker
Removing markers.

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| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 2.1 |
| **SESSION NAME** | Recap of elements covered |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | To confirm learning and reinforce key learning points covered on day before. |
| **Learning Outcomes** | To allow delegates to clear up any ambiguity before continuing with new subjects. |
| **Key Learning Points** | |

## Session 2.1: Recap of elements covered

**Activity**
Using the notes from day one briefly refresh the following topics, questioning and probing as necessary to confirm understanding of;

Elements affecting a free floating object. Run through the construction of a RR model from DSP to Datum. Plot on board asking delegates to provide relevant information.

Plotting on a chart the RR model from DSP to Datum, confirm correct use of symbols and annotation. Reinforce the need for accuracy.

Confirm the understanding of the errors inherent in any SP model, the values applicable to each and how they are applied. This will lead to a suitable error radius around the Datum position.

SAC using an example worked earlier, run through the SAC form and confirm understanding of all parts, especially para G.

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| **SESSION NUMBER** | 2.2 |
| **SESSION NAME** | Rapid response in SARIS |

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| **SCHEDULED SESSION TIME** | 01:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A walk through of how to apply and import the wind information into SARIS. |
| **Learning Outcomes** | Delegates will be able to produce a rapid response search area giving due consideration to individual drift elements and correct selection of search objects.<br><br>To be able to enhance the graphical display of a SARIS derived search area and understand functions that will aid the creation of a Rapid Response or Datum Point model |
| **Key Learning Points** | |

## Session 2.2: Rapid response in SARIS

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

**Demonstrate**

**How to construct a Rapid response model in SARIS;**

**Open the model manager and select new model, DP, DL, BT or SAC.**

**The model name should be in the agreed format. GIN, ID, Model Type, Phase and DT (DTG) no punctuation. Enter initials in user name field**

**The notes section must be completed fully to give all information (covered in more detail after this session)**
**DST, DT and DET**

**Make sure the DST is correct and all times are UTC**

**Make sure the DT is the time of the arrival of the first unit on scene and they have an appreciation of what the DET should be.**

**Ensure the correct entry of the DSP check N, E/W.**

**Entry of wind information. Check how many wind elements are needed. Use local wind information if available and applicable. WDC tick box should not be selected.**

**Consider the target type and selection of an appropriate leeway value. SAR G+T may be appropriate to use, easier to read and more up to date. For a RR model, it may be better to model for one object only at this stage.**

**Note; if there is no wind make sure the formula is set to 0 a formula of 0.07 u +0.04 will still give a leeway speed even if u=0.**

**Explain**

**'Drift Error' values.**
**If the DSP is a Fix, then there is no DR element and 'Craft Type' should stay as 'Not Applicable'. If the DSP is a DR then DR error may be applicable and the correct 'Craft Type' should be entered to achieve the correct DRe value. Use the aeroplane options to achieve 5, 10 or 15%.**

**Demonstrate**

**Save the model – it will tell you if it has saved successfully and the number of models! Note is SARIS 4 it is possible to run multiple models – only do this if operationally required or you are running a multi leg datum line plan.**

**Activity**

**Following the principles above, rework a manually calculated RR search area using SARIS. Use this to reinforce best practice in terms of data entry and consideration of drift element variables. Also check for understanding of less used options.**

**Explain**

**That in the comparison of manually calculated search plans and SARIS plans there will be slight differences in the calculation of the drift elements, mainly due to more accurate tidal drift values applied in SARIS rather than the less precise values derived from tidal diamonds. The resultant drift distance will also be different and therefore, a slight difference in the size of the search area. Leeway values should be the same.**

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| **SESSION NUMBER** | 2.3 |
| **SESSION NAME** | Notes in SARIS |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **Flip Chart**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A group exercise and discussion on what information should be included within the notes section in SARIS. |
| **Learning Outcomes** | Enhance the understanding and use of the notes section within SARIS. |
| **Key Learning Points** | |

## Session 2.3: Notes in SARIS

**Group Activity 20 mins**
Split course into groups, Give them a flip chart and markers and have them write out what information they think is relevant in a search plan and should be within the notes section within SARIS. Tell them that it should not be a repetition of what is withheld in Vision but a log of what decisions have been made whilst SAR planning.

Nominate a 'speaker' from each of their groups to deliver what information they think is relevant to a SAR plan back to the whole group.

**Explain**
Once all information has been collated form the group if there are any gaps, fill them in.

Remember it is not always what that is important but WHY!

**Model answer;**

- WDC info – if and why
- Divergence info – if and why
- Leeway formula info (what formula has been chosen and why)
- DSP
- Mid search time decision (if applicable)
- Passage info
- FIXe that has been chosen and why i.e. satnav or visual estimation etc.
- If increasing or decreasing the Drift Error and why.
- DRe % value if applicable and why
- How the DR position was derived and how far from LKP/DSP
- Information on the vessel; Description, Name, Liferaft and type carried, POB and information what they are wearing, the state the vessel is in i.e. dismasted or taking water etc.
- Whether using gridded server or not.
- Water temp.
- Weather and visibility info
- Sea state info
- SAR planners name
- MC (SAR) or MC name

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| **SESSION NUMBER** | 2.4 |
| **SESSION NAME** | Extending Datum time |

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| **SCHEDULED SESSION TIME** | 00:10 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A walk through of how to extend the datum time and its application. |
| **Learning Outcomes** | Delegates will be able to extend the datum time of any search plan, which is a key tool for forward planning. |
| **Key Learning Points** | |

## Session 2.4: Extended Datum time

### Explain

It is possible to extend the Datum Time within SARIS for a forward look of what is going to happen to a search object.

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

### Demonstrate

How to extend the Datum Time;

In the top menu, click 'SARIS' → 'Extend Datum Time'
The 'Extend Datum Time' window will open.
The original Datum Time will be in the upper box, enter the date and time you require in the lower box and click 'OK'.
When the model runs the new area will be shown outlined in black **the old Datum Time area will not be displayed – draw around it beforehand.**
THE ONLY WAY to return to the original Datum Time is to stop the model and then run the model again.

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| **SESSION NUMBER** | 2.5 |
| **SESSION NAME** | Mid search time |

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| **SCHEDULED SESSION TIME** | 00:20 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **OVERVIEW** | A discussion on mid search compromise and how it should be used. |
| **Learning Outcomes** | Delegates will be able to identify why we use a mid-search time for search planning beyond the Rapid Response criteria. |
| **Key Learning Points** | |

# Session 2.5: Mid search time

## Explain

The Datum Time determines the size, shape and position of the search area. As Datum Point searches cannot at the moment be dynamic (i.e. allow for target drift during the search), the decision on what Datum Time to use and what area to actually search is critical.

### Start-of-Search versus End-of-Search Datum Time

The search areas associated with the start-of-search and the end-of-search times will be different. As time goes by the area moves, and more than likely, expands.

Searches based on the start-of-search or end-of-search times do not allow for target drift and basically ignore each other's existence. The first takes no account of where the target might drift to during the search and the latter takes no account of the area in which the target is likely to be at the start of search.

Neither of these are really satisfactory options and it is therefore unlikely, unless target drift is inconsequential, that the SMC will consider either of these as the Datum Time to select.

### Mid-Search Datum Time

A compromise to the above is to use a mid-search time as the Datum Time.

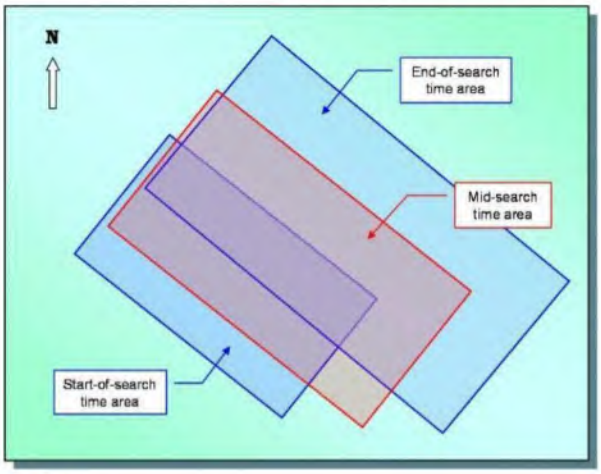
The first question facing the SMC/search planner here is how to determine the mid search time. This will of course depend on how long the search will take to complete, which depends on the size of the area, which depends on the time for which it is calculated.

If considering a mid-search Datum Time, the easiest solution for the SMC is to pre-determine how long the search should take, taking into account factors such as available light, SRU on-scene endurance, search crew fatigue, environmental conditions, survivability etc. Once the search duration is decided, the mid-search time is easily identified.

What this will produce is an area mid-way between the start-of-search and end-of-search areas.

**DRAW A DIAGRAM ON A WHITEBOARD TO ILLUSTRATE THIS POINT. (example from OmS below)**

The mid-search compromise is at its best when the target drift rate is low so that the start and end-of-search areas are not too far apart and there is considerable overlap of these by the mid-search area.




If the search duration is excessive and/or then target drift rate high, it is possible that there could be very little or even no overlap of the areas and wherever the SMC starts the search from it will not be in a valid area. If this is the case, the SMC should consider conducting two or more shorter duration searches.

If it is considered that a mid-search area compromise is appropriate, and particularly if resources are limited, the issues for the SMC will be which pattern to use and whether to employ a down-drift or an up-drift search.

**Explain**

For the rest of this course you will use a mid-search compromise there are other options available to use operationally and it is up to you as CPD to research the 'Combined datum time' principle.

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 2.6 |
| **SESSION NAME** | Datum point principles |

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| **SCHEDULED SESSION TIME** | 03:00 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Advancing the basic search planning principles using SARIS by creating a Datum Point plan. |
| **Learning Outcomes** | To advance the RR SAD to the DP SAD model by introducing WDC and divergence.<br><br>Highlight the differences between the two models and where these additional elements are displayed in the SARIS report. |
| **Key Learning Points** | |

## Session 2.6: Datum Point principles

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

### Demonstrate

**Open the model manager as before, completing the model name and notes as appropriate. Remind delegates that they will need to return to the notes during the modelling process.**

**Discuss the selection of the datum time. In particular, an estimation of mid-search time based upon;**

**Endurance of SRU**
**Survivability**
**Darkness**
**Weather**
**How long the area will be valid**
**Any other factors**
**Discuss the complication of carrying out an over the ground search for a moving and expanding search area.**

### Explain - WDC

Wind Driven Current (or Local Wind Current as it is also known) is due to the effect of sustained local winds on the water's surface. The exact effect is not clear, but it is generally accepted that after 6 to 12 hours of wind in a constant direction, a local surface current is generated. The estimated average wind velocity and direction for the previous 24 to 48 hours is required in order to determine the WDC.

If WDC is considered, then the search planner must obtain the past, present and forecast wind information in terms of direction and strength, from 48 hours before the Drift Start Time and up to and including the Datum Time.

When considering the inclusion of WDC, particularly when planning searches in inshore areas, remember that WDC only occurs where there is sufficient fetch. If the search area is close inshore and the prevailing wind is offshore, there will probably be insufficient fetch for WDC to be produced. If however the wind is onshore, there may be a considerable fetch, sufficient to produce WDC.

The effect is normally only considered to occur in depths of 30 metres or more and at distances of 25 miles or more offshore.

The process of obtaining wind information can take some time. If the SMC/search planner is faced with the need to produce a search plan very quickly, a decision must be taken whether or not to include WDC. If the initial response is one of a Rapid Response nature, then WDC is not applied. The SMC should consider requesting the wind

information if the incident is likely to be protracted, so that it will be available for future search plans.

Wind history & sea state details are also available in 6 hour blocks entitled SAR Data on the National Data Buoy Centre website. The time given for the 6 hour blocks is the middle of the period, unlike that from ARCC which is the beginning. The wind history is also for the precise location of the buoy, whereas the wind history provided by ARCC is

for a location and area specified by the SMC. The data buoys are a useful check of on-scene or nearby weather and do provide confirmation and confidence in weather reports or wind history provided from other sources.

***Note:*** **Prevailing Wind Areas**

Wind Driven Current is naturally generated and present in areas affected by prevailing winds. When the prevailing wind is blowing, WDC will be an inherent part of the tidal stream. It will therefore, most likely, be included in any 'observed' source tidal stream data.

In these areas therefore, if the prevailing wind is blowing as normal, no 'additional' WDC allowance should be made. If however there is no wind at the time of modelling or the wind is blowing from a non-prevailing direction, and this has been the case for some time, thought should be given to removal of the WDC element (by reciprocation), or comparative modelling (i.e. comparing areas with and without WDC) and making a professional judgement about its application.

*IAMSAR Ref: Vol 2 Chapter 4 Section 4.4.5 (Note: WDC is referred to in IAMSAR as Local Wind Current)*

## Demonstrate

**The selection of drift objects, possibly more than one. In particular discuss;**
**Leeway rates (figures not description)**
**Divergence – why we consider this in a DP model and not in a RR**

**Ensure each object is updated individually**
**Enter the appropriate Fix error – note that this is not just the means of navigation but also the circumstances in which the position was given.**

**Enter DRe as necessary**

**Update each object individually**

**Activity**
**Carry out the exercises as necessary to validate learning and review the SARIS reports.**

HM Coastguard

# Coastguard Programme

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 3.1 |
| **SESSION NAME** | Recap of elements covered |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | To confirm learning and reinforce key learning points covered on day before. |
| **Learning Outcomes** | To allow delegates to clear up any ambiguity before continuing with new subjects. |
| **Key Learning Points** | |

## Session 3.1: Recap of elements covered

**Activity**

Using the notes from day two briefly refresh the following topics, questioning and probing as necessary to confirm understanding.

HM Coastguard

# Coastguard Programme

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| **COURSE** | MOO PROGRAMME |

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 3.2 |
| **SESSION NAME** | SAC principles |

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| **SCHEDULED SESSION TIME** | 01:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A session based on SAC within SARIS. |
| **Learning Outcomes** | Demonstrate the addition of SAR resources to the search area while appreciating the selection of variables, including speed, height, OSE and detection aids.<br><br>Delegates also able to fully understand the relationship between A, V, S and T and be able to manipulate SRUs to obtain the best coverage. |
| **Key Learning Points** | |

## Session 3.2: SAC principles

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

### Demonstrate

Each delegate to enter the model manager and select a rapid response or datum point model that they have created earlier. Demonstrate the 'Proceed to SAC' button and selection of the chosen search area to open the SAC window.

**NOTE;** it is possible to select the incorrect search area – if you are modelling for various search objects e.g. PIW, life raft and the vessel and you would like to proceed to SAC with the life raft, even if you have selected the other objects to not be visible within the SARIS tools you can still select these areas to proceed to SAC. Be warned – make sure you select the relevant search area.

Discuss and demonstrate where appropriate (sea state) - the options available in this window in terms of the relationship between wind speed and sea state and the importance of selecting the correct sea state.

Discuss the lists of day and night detection aids. Consider when a detection aid (only one may be selected) should be chosen. Remind delegates of the concept of 'casualty culture' – equipment carried by a casualty and how the crew of the vessel may use it.

Consequently, decide if selection of a detection aid is appropriate. (Suggest it is easier to select one now rather than later even if not subsequently used).

### Explain

The importance of selecting the correct target type and what this means to SARIS. The target type is what the sweep width values within SARIS are based on, if you select the wrong target type all of your effort allocation for the SAC phase will be incorrect.

### Demonstrate

Work through the SRU form considering;

- type of SRU
- Height of eye or radar scanner
- On scene endurance
- Speed
- Height (aircraft) and the impact on Wc
- Fatigue correction – when is it appropriate?
- Selection of electronic detection aids
- Search pattern and type of search

Note how the corrected sweep width changes as the variables above are entered/changed

SRU to be dragged to the search area (at this stage – all the area is to be covered).

Demonstrate how the search area may be stretched without changing the overall size of the area.

Allocate the SRU to the area and use the 'Fit to Area' function to ensure a perfect fit.

Show how the side-bars may be dragged to other areas of the screen and then re docked at their original place.
Once the SRU has been assigned to the search area, in model manager plan name – change SAD to SAC and resave the model.

Discuss the modified model name with delegates.
Leeway rates (figures not description)
Divergence – why we consider this in a DP model and not in a RR

Ensure each object is updated individually.

**Explain**
The drawbacks of the 'Fit to area' function;
If the search area is smaller than what your unit can cover it will fit the unit to the area for the full amount of time giving a coverage factor more than 1 which is not a good use of a unit.

**Demonstrate**
The 'Manipulate the sub-area' button followed by the selection of the desired sub-area. (Mouse-over the area(s) to see the effect.)

The initial aim is to increase the value of S to a navigable figure which will reduce the EST or T. Demonstrate the selection the S button followed by 'Time' from the new window.

Change the value of S (by slider or entering values) and show how the other variables change in the Allocated SRU, Sub-Area windows and on the map. On completion, R-click and either Confirm or Cancel to keep or reject changes.

In a controlled manner, demonstrate the manipulation of the sub-area by changing different values.

Discuss with delegates the pros and cons of searching the whole area. If it is not possible to search the whole area to a satisfactory POD, discuss the options.

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 3.3 |
| **SESSION NAME** | SAC only |

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| **SCHEDULED SESSION TIME** | 01:00 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Creation of SAC models when given search area co-ordinates, utilising the SAC ONLY model within SARIS. |
| **Learning Outcomes** | Demonstrate the addition of SAR resources to the search area while appreciating the selection of variables, including speed, height, OSE and detection aids.<br><br>Delegates also able to fully understand the relationship between A, V, S and T and be able to manipulate SRUs to obtain the best coverage. |
| **Key Learning Points** | |

## Session 3.3: SAC only

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

**Demonstrate**
Each delegate to enter the model manager and select a SAC only plan.

SARIS will need data input of search area co-ordinates. As you can see SARIS only requires the A, B and C positions, from this the program works out where D is.
**NOTE;** you should check that the co-ordinates are correct once you have moved through to the SAC phase. There will be small differences.

**Activity**
Delegates to complete a number of exercises to consolidate their learning.

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# Coastguard Programme

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| **COURSE** | MOO PROGRAMME |

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 3.4 |
| **SESSION NAME** | Search Instructions |

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| **SCHEDULED SESSION TIME** | 00:20 |

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| **RESOURCES NEEDED** | **OmS**<br>**Projector** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A session covering the principles of passing search instructions to different types of SRU's. |
| **Learning Outcomes** | Delegates will be able to pass search instructions effectively to any type of SRU. |
| **Key Learning Points** | |

## Session 3.4: Search Instructions

Use OmS to signpost delegates to the RNLI TRG 115 for passing search instructions to ALBs and ILBs. (http://m3net.mcga.gov.uk/c4mca/trg115-sarmarch2008-2.pdf)

RVL Counter Pollution Aircraft.
(http://oms.mcga.gov.uk/oms_operational_detail/rvl_counter_pollution_aircraft.htm)

MOD and MCA SAR helicopters.
(http://oms.mcga.gov.uk/oms_operational_detail/search_details_and_instructions_to_srus.htm)

Other Declared - TAPSIC

Non declared SAR resources.
(http://oms.mcga.gov.uk/oms_operational_detail/search_details_and_instructions_to_srus.htm)

**Explain**
Make sure that you display each form and discuss the format.

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 3.5 |
| **SESSION NAME** | Datum Line Principles and exercises |

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| **SCHEDULED SESSION TIME** | 01:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Advancing the basic search planning principles using SARIS by creating a Datum Line plan. |
| **Learning Outcomes** | Delegates will understand the philosophy and construction of a datum line model. In particular, when it is appropriate to use a datum line model and the factors that need to be considered in its construction. |
| **Key Learning Points** | |

## Session 3.5: Datum Line principles and exercises

**Explain and Demonstrate**
Using the white board, draw a vessel's passage from port A to port B. Annotate with time of departure and length of passage or ETA.

Refresh the Speed/Distance/Time calculation to achieve an average speed over the passage.

Discuss the selection of a suitable datum time for the search area. Remember that the ETA must have passed for this to be an overdue situation therefore the datum time must be after the ETA.

The first DSP will, normally, be at the LKP (in this case the point of departure)
On the board, construct a DP model from the LKP (DSP1). Explain that DRe will be zero and the DET will be at a maximum.

Explain that the Fixe is the error at the LKP and does not change throughout the model – whether a single or multi-leg model.

**Explain**
Initial consideration of the selection of DRe and the vessel it is being applied to. A sailing vessel tacking off the line, a fully kitted motor cruiser or a commercial vessel... Consider various vessel types and the scale of DRe they may attract. A yacht tacking along a route against a merchant vessel against a motor cruiser fully fitted with auto pilot etc. How may the weather condition affect this decision? What confidence is there in the selected route? Has casualty culture been sufficiently considered? Think about time of day, the persons on board, how firm was the arrival time, any previous occurrences of being overdue etc.?

**Explain and Demonstrate**
Designate a number of DSPs along the track line and consider the construction of a DP model from each. Note how the DR error will increase and the DET will decrease as the vessel proceeds along its passage.

While not technically necessary, it may be worth considering establishing DSPs at likely danger areas. In this way, a DP model is automatically created at that point if it is decided to prioritise 'hot spots' along the route. Overall, there should be a good coverage of error circles when the model is run.

Would DRe be applicable at all if the passage of the craft is known? MOB for example or track from AIS. The vessel may have deviated from the course for collision avoidance for example. Think about answers needed in order to gain the full picture.

**Demonstrate**

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

Construct a SINGLE leg Datum Line plan in SARIS with the projector on so that the delegates can follow you step by step through the process.

**Activity**

Allow the delegates to conduct a couple of SINGLE leg datum line exercises before.....

**Explain and Demonstrate**

On the board, run through the principle of the multi-leg datum-line model with emphasis on the calculation of the DRe.

**Demonstrate**

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

In SARIS construct a multi-leg datum line model and explain the application of the distance override function.

**Activity**

Allow the delegates to conduct MULTI leg datum line exercises.

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 4.1 |
| **SESSION NAME** | Recap of elements covered |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | To confirm learning and reinforce key learning points covered on day before. |
| **Learning Outcomes** | To allow delegates to clear up any ambiguity before continuing with new subjects. |
| **Key Learning Points** | |

## Session 4.1: Recap of elements covered

**Activity**

Using the notes from day three briefly refresh the following topics, questioning and probing as necessary to confirm understanding.

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 4.2 |
| **SESSION NAME** | Datum Line exercises |

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| **SCHEDULED SESSION TIME** | 03:00 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Further Datum Line exercises. |
| **Learning Outcomes** | Creating Datum Line models and the factors that need to be considered in its construction. |
| **Key Learning Points** | |

## Session 4.2: Datum Line exercise

**Activity**

Further Datum Line MULTI leg exercises to confirm learning.

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| **COURSE** | MOO PROGRAMME |

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 4.3 |
| **SESSION NAME** | Backtrack principles and exercises |

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| **SCHEDULED SESSION TIME** | 02:00 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Advancing the basic search planning principles using SARIS by creating a Backtrack plan. |
| **Learning Outcomes** | By the end of this session, delegates will have a full understanding of the back track model, how and when it is used and when it may be used when there is only limited information.<br><br>Creating Backtrack models and the factors that need to be considered in its construction. |
| **Key Learning Points** | |

## Session 4.3: Backtrack principles and exercises

**Explain**

To the class when a back-track should be considered – found object, further search objects still missing, preferably with a known drift start time. (That a BT solution may be used even if there is no DST will be discussed later)

Consider the four scenarios for the new drift object(s) – same time/same object, same time /different object, different time/same object, different time/different object.

On the board, from a found object position, explain the back-track element, arriving at three DSPs.

From each DSP, drift on an object to the chosen datum time giving nine Datum Positions

**Explain the application of FIXe and that it is only applied to the found location – not to the DSPs.**

Discuss the application of leeway and drift error.

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

**Explain and Demonstrate**

Open SARIS and using Incident Location function, commence a back-track model. Highlight the model name format.

Work through the back-track model manager identifying the differences between the DP and BT models – Found time, DST and DT; Fixe to be applied to the found object only.

Run the model showing that the model pauses at the DSP stage. Release pause to continue.

The DSPs are marked with small crosses while the found position is not. So it may be preferable to mark the found position with a position marker.

Show how the drift objects advance under the influence of divergence to give nine datum positions as previously explained.

When considering the datum time – point out that the first search unit is already on scene – that is, the finding vessel. Consider what type of vessel the finding vessel is and what type of search it may be able to undertake.

Add a number of drift objects to understand the potential size of the search area and the potential need to identify and focus on hot-spots.

**Explain**

When there is no DST available it is still possible to use a back-track model.
Create a back-track model with a DST well into the past. Consider when this may be.

Run the model back in stages watching the changing DST in the right hand panel. As the model progresses back, note the time as the DST passes through areas of potential danger – high shipping density, shoals and overfalls, passage of bad weather etc. These locations with their associated DSTs may be used as the basis for drifting forward further drift objects.

Discuss how SARIS may be used as normal for this function but the results will be only very approximate – often just the general direction. Give information with caution. Note that there is unlikely to be any DST and the accuracy of SARIS is severely compromised when calculating drifts inshore.

**Activity**

Delegates to carry out a number of Backtrack exercises to confirm their learning.

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 4.4 |
| **SESSION NAME** | Additional vessel SAC |

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| **SCHEDULED SESSION TIME** | 01:00 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A session outlining how to add additional vessels that are transiting your search area into a SAC plan |
| **Learning Outcomes** | By the end of this session, delegates will be able to incorporate vessels (or aircraft) which are making a single pass through the search area. They will be able to evaluate their search effort by contributing to the overall POD along their tracks. |
| **Key Learning Points** | |

## Session 4.4: Additional vessel SAC

**It is important that all delegates are sat behind their terminal during this session so that they are able to follow you step by step and 'feel' their own way through SARIS.**

**Explain and Demonstrate**
Open a previously constructed SAC model.

Given the position, course and speed of a SRU, place a marker at the vessel's position and to appreciate its planned track through the search area.
By measuring, calculate how many whole hours of steaming it will take for the vessel to pass completely through the search area.

Add the vessel to the plan, applying 1 hour and 11 minutes OSE for each required hour of passage as calculated above (1hr 11m OSE = 1hr 00m EST).

Drag the SRU to the chart and position so that the centre of one side is aligned with the place marker above. Rotate the search area to the course of the vessel (it may be necessary to ± 90°)

Stretch the search area in the direction of the SRU course until the length is equal to the distance the vessel will have steamed in the selected number of hours. Note that the width is now equal to Wc therefore, within this search area, POD = 79%

The combined POD tool may be used to evaluate the effect this vessel's search will have when considered alongside other SRUs which are carrying out more structured search patterns within the same area at the same time.

Discuss the possibility of co-ordinating vessels so that they cover as much of the search area within their normal track as possible.

**Activity**
Delegates to carry out a number of Backtrack exercises to confirm their learning.

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| **COURSE** | MOO PROGRAMME |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 5.1 |
| **SESSION NAME** | Recap of elements covered |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | To confirm learning and reinforce key learning points covered on day before. |
| **Learning Outcomes** | To allow delegates to clear up any ambiguity before continuing with new subjects. |
| **Key Learning Points** | |

## Session 5.1: Recap of elements covered

**Activity**

Using the notes from day four briefly refresh the following topics, questioning and probing as necessary to confirm understanding.

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# Coastguard Programme

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| **COURSE** | MOO PROGRAMME |

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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| **SESSION NUMBER** | 5.2 |
| **SESSION NAME** | Report analysis |

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| **SCHEDULED SESSION TIME** | 00:30 |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**Exercises**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | Advancing the basic search planning principles, using real SAD reports from SARIS to analyse for faults – a key skill for any search planner. |
| **Learning Outcomes** | Delegates will be able to analyse a SARIS report in order to identify errors and validate the results of any SARIS model. |
| **Key Learning Points** | |

## Session 5.2: Report analysis

**Explain**

Search planners must be able, not only to create effective and accurate search plans of their own, but also to validate the search plan of others. Re-state that there is only one chance to create a valid search plan to give the casualty the best chance of rescue – so it has to be correct.

**Activity**

Explain the exercise. Give each delegate the first scenario (Datum Point) and allow them time to digest the information. Then present a copy of the associated SARIS report. There are a number of intentional errors.
After a suitable period of time talk through the report and ensure each error is identified. Discuss the implication of each error.

**Activity**

Allow the delegates to complete the further report analysis exercises of a datum line and backtrack.

HM Coastguard

# Coastguard Programme

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| **COURSE** | MOO PROGRAMME |

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| **MODULE** | F |

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| **UNIT NUMBER** | 03 |
| **UNIT NAME** | Maritime Search Planning Part 2 |

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|---|---|
| **SESSION NUMBER** | 5.3 |
| **SESSION NAME** | Free format consolidation |

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| **SCHEDULED SESSION TIME** | UNTIL COURSE CLOSURE |

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| **RESOURCES NEEDED** | **SARIS Suite**<br>**SAR G+T**<br>**Parallel Rules**<br>**Dividers**<br>**2b Pencils**<br>**SAD Worksheets**<br>**Tidal Vector Worksheets**<br>**Charts**<br>**Exercises**<br>**Projector**<br>**Paper**<br>**Pens** |

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| **LINKS TO OTHER UNITS/ MODULES** | |

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| **OVERVIEW** | A free format session till the end of the day, giving the delegates the opportunity to revisit any part of manual or SARIS driven SAD or SAC with the added benefit of having a trainer present to clear up any ambiguity. |
| **Learning Outcomes** | Delegates able to consolidate their learning by practicing any elements from either SP1 or SP2 with the benefit of a trainer present. |

| Key Learning Points | |
|---|---|

## Session 5.3: Free format consolidation

**Explain**

A free format session till the end of the day, giving the delegates the opportunity to revisit any part of manual or SARIS driven SAD or SAC with the added benefit of having a trainer present to clear up any ambiguity.