Input paper: [[1]](#footnote-1) VTS45-10.2.2

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Workplan Task Number / Technical Domain 2 …………………………………………

Working Group WG 3……………………………….

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Formula for Calculation of VTS Staffing Levels

# Summary

This paper proposes an amendment to the formula for determining the number of VTS operators required for staffing a VTS Centre that is published at the annex to the existing Guideline 1045.

## Purpose of the document

The purpose of this input paper is to provide an updated version of the annex.

# BACKGROUND

The current annex to Guideline 1045 is inadequately presented and poorly understood. Those who attempt to use the formula frequently find the results achieved are of little value. It has been widely criticised as useless and it has been suggested by many that the annex and the formula should be removed from the next update to Guideline 1045. The current inadequacies of the Annex detracts from the importance of this Guideline.

# Discussion

## The formula at Annex A to the current Guideline is deficient in many areas. No guidance is given on data input and several of the steps are unnecessary. The purpose of the formula is poorly explained in that it infers that the formula itself produces a working solution for practical use. This is most unfortunate as the original author of the formula generated quite a clever calculation which, if followed as intended, provides an objective and very useful first step in establishing staffing levels. The key point that is not explained is that the calculation is only the first step in identifying theoretical minimum staffing levels from which a practical solution can then be derived.

## With proper guidance on how the input data should be determined and what the output really means, this formula can provide a very helpful and objective method of determining theoretical staffing levels. With additional explanation, it can also provide valuable guidance on how this theoretical value can be used in determining a practical solution. The current calculation is poorly presented with no logical flow which tends to obscure the purpose of each calculation stage; this only serves to add to the confusion and mistrust users have in the result.

## A revised version of the annex is proposed for consideration by Working Group 3 of the VTS Committee and forwarded at Appendix 1. The revised annex provides a much clearer explanation of the purpose of the calculation and then develops it into further “Next Steps” providing guidance on how to use this theoretical value to develop a practical solution. The data is set out sequentially to show clearly what is required as input data and what requires to be calculated.

## This revised annex lends itself ideally to presentation in Excel Spreadsheet format and this is provided at Appendix 2. All of the calculation stages are worked out automatically and the user can immediately identify how each change to the various input fields impact on each stage of the calculation and the theoretical final total value. If adopted, it is recommended that IALA make the Excel spreadsheet available for download direct from the website together with the revised Guideline. If this is not possible, it is understood that provision already exists for such spreadsheets to be made available from IALA on request and an appropriate note will have to be added to the draft Annex.

## Whilst a review and update of Guideline 1045 has not been identified as a task in the 2018-2022 work programme, it is considered that this proposal meets an urgent need to correct errors in the annex to Guideline 1045. No further work should be required and it only requires validation by WG3. If supported, the old Annex could simply be substituted with the new version and the Guideline reissued together with the new calculation spreadsheet. This will overcome the current adverse comment. Far from deleting the annex, its retention and improvement should result in its recognition as a valuable tool for assessing staffing levels.

## *Note: Cells greyed out on the table and in the spreadsheet are included only for the purposes of referencing the new draft to the existing annex and should be deleted before finalisation of the documents.*

## 

# References

1. IALA Guideline 1045 – Staffing Levels at VTS Centres

# Action requested of the Committee

Working Group 3 of the Committee is requested to consider the proposed amendments to Annex A of Guideline 1045 at Appendix 1 and to forward the Guideline with this amended annex for approval and reissue.

1. Draft Update to IALA Guideline 1045 Annex A - Formula for Determining the Theoretical Number of VTS Operators/Supervisors Required for Staffing a VTS Centre
2. Draft IALA Guideline 1045 Annex A – VTS Staffing Calculation Spreadsheet.

# *ANNEX A: FORMULA FOR DETERMINING THE THEORETICAL NUMBER OF VTS OPERATORS/SUPERVISORS REQUIRED FOR STAFFING A VTS CENTRE*

This formula is designed to guide a VTS Authority towards the general considerations that should be addressed in assessing appropriate staffing levels for a VTS Centre. It provides a theoretical starting point for more detailed decision making. Adjustments will then be necessary to convert this theoretical outcome into a practical solution. This approach provides a degree of objectivity in setting and establishing staffing levels. This formula is applicable to both VTS Operator and VTS Supervisor staffing levels.

**Given Input Data:**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Was** | **Comment** |
| 'a' | = hours per day (normally 24) | h | “normally” added |
| 'b' | = actual days per week (normally 7) | e | “normally” added |
| 'c' | = actual days per year (normally 365.25) | f | “normally” added |
| 'd' | = Individual (contracted) hours per working week 1 | a | Emphasise this is the “contracted” hours per week per individual |
| 'e' | = normal hours per shift 2 | b | Was “..per day”. I think it means per shift (normally either 12 or 8) |
| 'f' | = hours leave per year 3 | x | Leave separated out (was combined with sickness) |
| 'g' | = hours sickness per year 4 | x | Sickness separated out (was combined with leave) |
| 'h' | = hours training per year 5 | y | No Change |
| 'i' | = Individual mins lost per shift (meals, handovers, position breaks etc.) 6 | ww | Was “..per day”. I think it should be “.. per shift” as subsequent calculations are on an individual basis. |
| 'j' | = number of operational VTS work stations | k | Gender-free description! |
| **Calculate (see calculation stages below):** | | | |
| 'k' | = Individual hours per year before deductions | c | Definition amended for clarity |
| 'l' | = Individual hours after deductions for leave, sickness and training | z | No change |
| 'm' | = working shifts per year | d | Was “.. days per year” with “shifts” in brackets. Clearer with just “…shifts per year”. |
| 'n' | = Individual hours lost per shift (break & handover) | yy | Was “..per day”. Changed to “..per shift” (see 'ww' above) |
| 'o' | = total hours lost per year | zz | No change |
| 'p' | = total duty hours per VTSO/Supervisor per workstation per year | cc | Definition amended for clarity |
| 'q' | = actual hours per year | ff | No change |
| 'r' | = number of VTSOs/Supervisors required per VTS workstation | v | No Change |
| **'T'** | **= Total number of VTSOs/Supervisors required** **for staffing a VTS Centre** | **T** | No change |
|  |  |  | **Deleted (not used in original or updated calculation): 'g', 'dd', 'ee'.**  **Deleted as it is an unnecessary step: 'xx'** |

**Calculation:**

|  |  |  |  |
| --- | --- | --- | --- |
| Stage 1: | k = d \* (c / b) | Stage 6 | p = l - o |
| Stage 2: | l = k - (f + g + h) | Stage 7: | q = a \* c |
| Stage 3: | m = l / e | Stage 8: | r = q / p |
| Stage 4: | n = i /60 | Stage 9: | T = r \* j |
| Stage 5 | o = m \* n |  |  |

*(A separate Excel spreadsheet accompanies this Annex automating the calculations above after data has been inputted)*

|  |  |
| --- | --- |
|  | Input data - Normally fixed for a 24/7/365 VTS |
|  | Input data - Variable |
|  | Calculated |

**Notes:**

1. Individual (contracted) hours per working week ('d') are the terms of employment for an individual VTSO or Supervisor; typically, between 35 – 45 hrs per week.
2. Normal hours per shift ('e') is typically 12 or 8 hours.
3. Hours leave per year ('f') should be based on the number of days leave granted multiplied only by the shift hours per day (not the full 24 hours).
4. Hours sickness per year ('g') is an estimate based on historic records and averaged across the VTS department.
5. Hours training per year ('h') should include the training hours scheduled for the year.
6. Individual minutes lost per shift for meals, handovers and breaks etc ('i') should be based only on the individual. This will generate the necessary increase in staff required to enable staff rotation.

**Next Steps:**

The total, **'T'**, generated giving the “number of VTSOs/Supervisors required for staffing a VTS Centre” is the **theoretical** **minimum** to provide continuous cover of all workstations whilst also enabling all the criteria of leave, sickness, training, breaks and handover that have been set into the formula to be met.

It is then necessary to design a roster that will achieve this. In practice, designing a practical and workable roster is likely to result in a higher number of staff in order to meet this theoretical minimum requirement. There are, however, other practical considerations that may also need to be addressed in developing a tailored roster that meets the specific requirements of each individual VTS Centre. Some of these considerations may result in increases over the theoretical staffing level and others may result in reductions; these include:

* Consideration of local and cultural issues;
* Consideration of other shift-working arrangements that are already be in place within the authority;
* Consideration of activity levels in office hours during the working week compared with activity levels outside these hours;
* Consideration of varying but predictable traffic levels e.g. those due to tidal constraints;
* The use of a “day-worker” during periods of increased activity levels to enable staff rotation;
* Allowing staff to be stood down selectively but on immediate recall in periods of low activity;
* Substitution of a VTSO with a VTS Supervisor to allow breaks to be taken;
* Using certificated VTS Staff to support other shift work roles collocated with the VTS resulting in greater staffing efficiencies overall in a port’s control and/or administration centre.

Finally, benchmarking against existing VTS Authorities may also prove useful.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Input papers should be assigned to a work task as listed in the Committee work plan which is available in input papers. Leave open if uncertain but consider how the paper is to be processed if not relevant to a work task [↑](#footnote-ref-2)