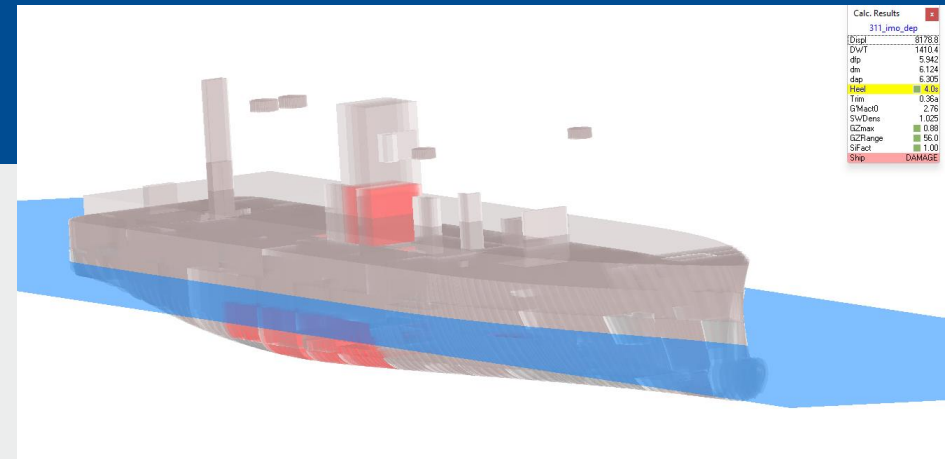


The LOADMASTER X5-SRtP Loading Computer



Presented by: Kjell Teepen
Naval Architect

KOCKUMATION GROUP

 Kockum Sonics  POLARMARINE  *Texon*

Why is a SRtP-compliant Loading Computer needed?



The Safe Return to Port regulations were implemented by SOLAS due to:

- A history of incidents on passenger ships with severe consequences
- Increasing size of vessels and number of passengers
- More remote and exposed operational patterns
- The risks associated with lifeboat evacuation

The regulation that started it all

SOLAS Reg. II-1 / 8-1.3

For the purpose of providing operational information to the Master for safe return to port after a flooding casualty,

- Passenger ships constructed (keel laid) **after 1 January 2014** shall have:
 - **Onboard Stability computer; OR**
 - **Shore-based support**

based on guidelines in MSC Circulars 1400, 1532

Passenger ships constructed **before** 1 January 2014 shall comply with above not later than the first renewal survey after **1 January 2025**

What's the best choice?

Regulations state that Shore Based Support (ERS) must be operational within 1 hour

The safe & reliable solution:

- A SRtP-compliant Onboard Loading Computer for instant access to stability evaluation and for additional guidance from experts
- Emergency Response Service, utilizing the latest stability data from the loading computer



- 3D model of hull and all compartments
- Accurate calculation based on any condition and combination of damaged compartments
- “Open to Sea” or “Fixed Volume” damage
- Possible to input damage description manually or with imported data from flooding detection system

The screenshot displays the LOADMASTER X5 - SRtP software interface. The main window is titled "Online Options" and contains a table of tank data. The table has columns for Name, Code, Sounding, Density, and Flow. The data is as follows:

Name	Code	Sounding	Density	Flow
<input checked="" type="checkbox"/> WB 182-197	T001-1	0.265	1.0190	0.0
<input type="checkbox"/> WB 182-197 backup	T001-2	0.430	1.0780	0.0
<input checked="" type="checkbox"/> WB 161-166	T005-1	0.266	1.0140	0.0
<input type="checkbox"/> WB 161-166 backup	T005-2	0.431	1.0790	0.0
<input checked="" type="checkbox"/> WB 143-159	T102-1	0.270	1.0180	0.0
<input type="checkbox"/> WB 143-159 backup	T102-2	0.435	1.0830	0.0
<input checked="" type="checkbox"/> WB 128-139	T202-1	0.285	1.0380	0.0
<input type="checkbox"/> WB 128-139 backup	T202-2	0.450	1.0980	0.0
<input checked="" type="checkbox"/> WB 106-114	T302-1	0.291	1.0390	0.0
<input type="checkbox"/> WB 106-114 backup	T302-2	0.456	1.0040	0.0
<input checked="" type="checkbox"/> WB 83-94	T402-1	0.301	1.0490	0.0
<input type="checkbox"/> WB 83-94 backup	T402-2	0.466	1.0140	0.0
<input checked="" type="checkbox"/> WB 58-67	T502-1	0.306	1.0540	0.0
<input type="checkbox"/> WB 58-67 backup	T502-2	0.471	1.0190	0.0
<input checked="" type="checkbox"/> WB 48-58	T503-1	0.307	1.0550	0.0
<input type="checkbox"/> WB 48-58 backup	T503-2	0.472	1.0200	0.0
<input checked="" type="checkbox"/> WB 25-33	T606-1	0.314	1.0620	0.0
<input type="checkbox"/> WB 25-33 backup	T606-2	0.479	1.0270	0.0
<input checked="" type="checkbox"/> DRY TANK 0-13	T702-1	0.315	1.0630	0.0
<input type="checkbox"/> DRY TANK 0-13 backup	T702-2	0.480	1.0280	0.0
<input checked="" type="checkbox"/> WB -9-4	T802-1	0.316	1.0640	0.0
<input type="checkbox"/> WB -9-4 backup	T802-2	0.481	1.0290	0.0
<input checked="" type="checkbox"/> WB 73-83	T413-1	0.303	1.0510	0.0
<input type="checkbox"/> WB 73-83 backup	T413-2	0.468	1.0160	0.0
<input checked="" type="checkbox"/> WB 58-71	T511-1	0.309	1.0570	0.0
<input type="checkbox"/> WB 58-71 backup	T511-2	0.474	1.0220	0.0
<input checked="" type="checkbox"/> WB 58-71	T512-1	0.310	1.0580	0.0
<input type="checkbox"/> WB 58-71 backup	T512-2	0.475	1.0230	0.0
<input checked="" type="checkbox"/> WB 46-58	T513-1	0.311	1.0590	0.0
<input type="checkbox"/> WB 46-58 backup	T513-2	0.476	1.0240	0.0
<input checked="" type="checkbox"/> WB 46-58	T514-1	0.312	1.0600	0.0
<input type="checkbox"/> WB 46-58 backup	T514-2	0.477	1.0250	0.0
<input checked="" type="checkbox"/> WB71-81	T414-1	0.304	1.0520	0.0
<input type="checkbox"/> WB71-81 backup	T414-2	0.469	1.0170	0.0

Other interface elements include:

- Ship Picture:** A 3D model of the ship's hull.
- OnLine Monitor:** A graph showing volume percentage over time, with a red line indicating "SP reached".
- Store Tanks:** A table listing tank names, filling status, and maximum volume.
- Calc. Results:** A summary of calculated values for "Lightship", including Displ (7074.8), DWT (324.8), dfp (4.483), dm (4.576), dap (4.669), Heel (0.2p), Trim (0.19a), G'Mact0 (0.75), G'Mcur (1-MinGM C...), SWDens (1.025), and WeatherCr (0.04).
- Rate of update:** Set to 60 seconds.
- Buttons:** OK, Cancel, Update, Print, All, Properties, Help.

- Effects of open/closed Watertight doors included in calculations
- Status of all Emergency escape routes
- All internal connections defined for progressive flooding

Watertight Doors

	Status	Elevation AWL m	Im.Heel SB deg	X m	Y m	Z m
WT1.31	Closed	-4.71	0.0	69.60f	3.20s	1.50
WT1.51	Closed	-3.63	0.0	42.60f	3.40p	1.50
WT2.21	Closed	-0.19	0.0	84.60f	0.00	5.20
WT2.31	Closed	0.31	0.0	69.60f	3.20p	5.20
WT2.32	Closed	-1.11	0.0	69.60f	3.20s	5.20
WT2.33	Closed	-1.37	0.0	59.10f	3.70s	5.20
WT2.34	Closed	-2.42	0.0	59.49f	8.49s	5.20
WT2.41	Closed	0.37	0.0	57.60f	4.20p	5.20
WT2.42	Closed	-0.48	0.0	51.30f	0.80p	5.20
WT2.51	Closed	0.09	0.0	42.60f	3.90p	5.20
WT2.52	Closed	-0.62	0.0	33.30f	1.30p	5.20
WT2.71	Closed	-1.29	0.0	5.70f	0.00	5.20
WT3.21	Closed	2.74	60.0	84.60f	0.00	8.20
WT3.31	Closed	3.24	60.0	69.60f	3.20p	8.20
WT3.32	Closed	1.82	60.0	69.60f	3.20s	8.20
WT3.41	Open	3.23	60.0	57.60f	3.90p	8.20
WT3.51	Open	3.15	60.0	42.60f	4.50p	8.20
WT3.61	Open	2.92	60.0	27.60f	4.40p	8.20
WT3.62	Closed	3.51	60.0	9.60f	8.20p	8.20
WT3.63	Closed	3.03	60.0	10.20f	6.00p	8.20
WT3.64	Closed	0.36	16.5	10.20f	6.00s	8.20
WT3.65	Closed	-0.13	11.9	9.60f	8.20s	8.20
WT3.71	Closed	2.70	60.0	9.00f	4.60p	8.20
WT3.72	Closed	1.15	60.0	7.80f	2.30s	8.20
WT3.81	Closed	2.02	60.0	1.80a	2.20p	8.20

Ship Picture

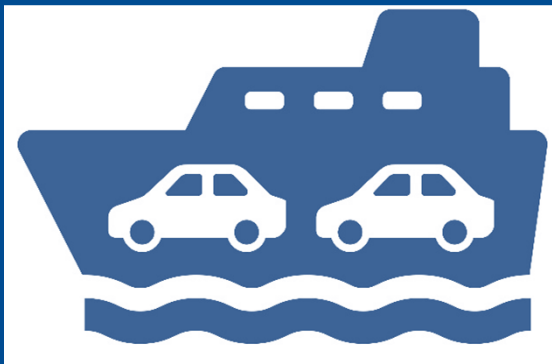
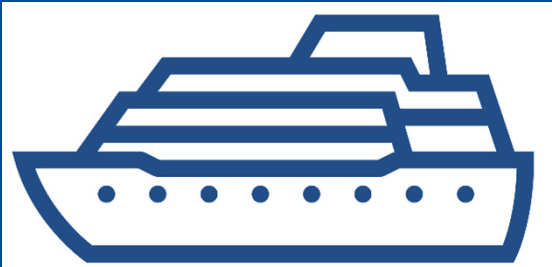
Calc. Results

331_imo_maxd_dep

Displ	8410.2
DWT	1641.8
dfp	4.965
dm	5.792
dap	6.619
Heel	12.9s
Trim	1.65a
G'Mact0	1.50
SWDens	1.025
GZmax	0.94
GZRange	47.1
StFact	0.52
Ship	DAMAGE

The LOADMASTER X5 - SRtP

- For RoPAX vessels – “Water on Deck” calculation according to Stockholm Agreement
- Clear & Accessible reports. Reports and electronic data can be sent to ERS to speed up their assistance.
- The Loadmaster X5 has a strong track record and approvals for SRtP compliance from DNV, LR, CCS.



中国船级社

地址 (Add): 上海市福州路
 邮政编码 (Post Code): 2001
 传真 (Fax): 021-53833
 电话 (Tel): 021-61093
 审图 (Prepared by): 王
 注册单位 (TO): KOCKUMATION
 抄送单位 (CC): CCS 现场

日期 (Date): 2021-10-22

Our reference: M-SA-GB-NICMAI 037926-1743

Your reference: M-SA-GB-037926-1

Job ID: M-SA-GB-037926-1

Document No. Rev. DNV No. Title Code Status

-	19-	1864	Test Conditions	107.2	Approved
-	19-	1865	Ship data	107.2	For Inf.
-	21-	1913	C_03+DamWOOFWOP2(EXT_130_150)	107.2	Approved

Document No. -118-Oct-2021, "Last Conditions" has been reviewed in accordance with DNV Rules for Classification - Ships (July 2021) Pt. 6 Ch. 4 Sec. 6, with the following comments:

468 Rule reference

Based on this document and the submitted ship data the software is approved for calculation and control of loading conditions with respect to the following requirements:

Intact stability:

- DNV GL rules for classification - Ships (January 2016) Pt. 3 Ch. 15 Sec.1 [4.1.1] and [4.2] (Main Class +1A) and Pt. 5 Ch. 4 Sec. 4 [1-2] (Class Notation Passenger ship), corresponding to the intact stability requirements of IMO 2008 IS Code Part A, Ch. 2 and Ch. 3.1

Damage stability (limit curve):

- SOLAS (2009) Reg. II-1/5 to 9.8

Longitudinal strength:

- Check of bending moment and shear force against approved limits

Damage control:

- Check of damage stability for real case scenario as required by SOLAS 2009 Reg. II-1/5-1.3.1

DNV Headquarters, Veritasveien 1, P. O. Box 300, 1322 Høvik, Norway. Tel: +47 67 97 90 00. www.dnv.com

LR 921
 Final Enhar
 Appraisal of the long
 'LOADMASTER

This Design Appraisal Document super
 dated 30 November 2020.

- The Document(s) listed in paragraph 1 - "Approval of Loading Computer" for specific ship approval for strength an appraisal status as indicated subject
- Final acceptance of the Loading Comp witnessed by a Lloyd's Register survey
- It remains the Master's responsibility item are included in any assessment.
- The supplier is responsible for ensuring handling changes without loss of per software and hardware to handle of has not been demonstrated to Lloyd's
- The Master should be aware that reg damage stability should be undertake made to tank content (for example if emptied), such changes may have sig

General Comments:

6. The program has General Approval f

FINAL ACCEPTANCE OF

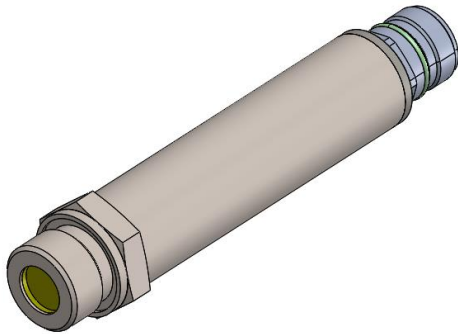
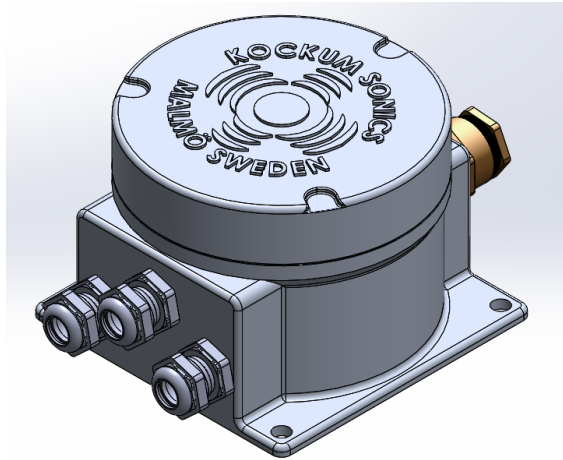
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PL-1483899REV 02020.02

SRtP regulations for the Flooding Detection System



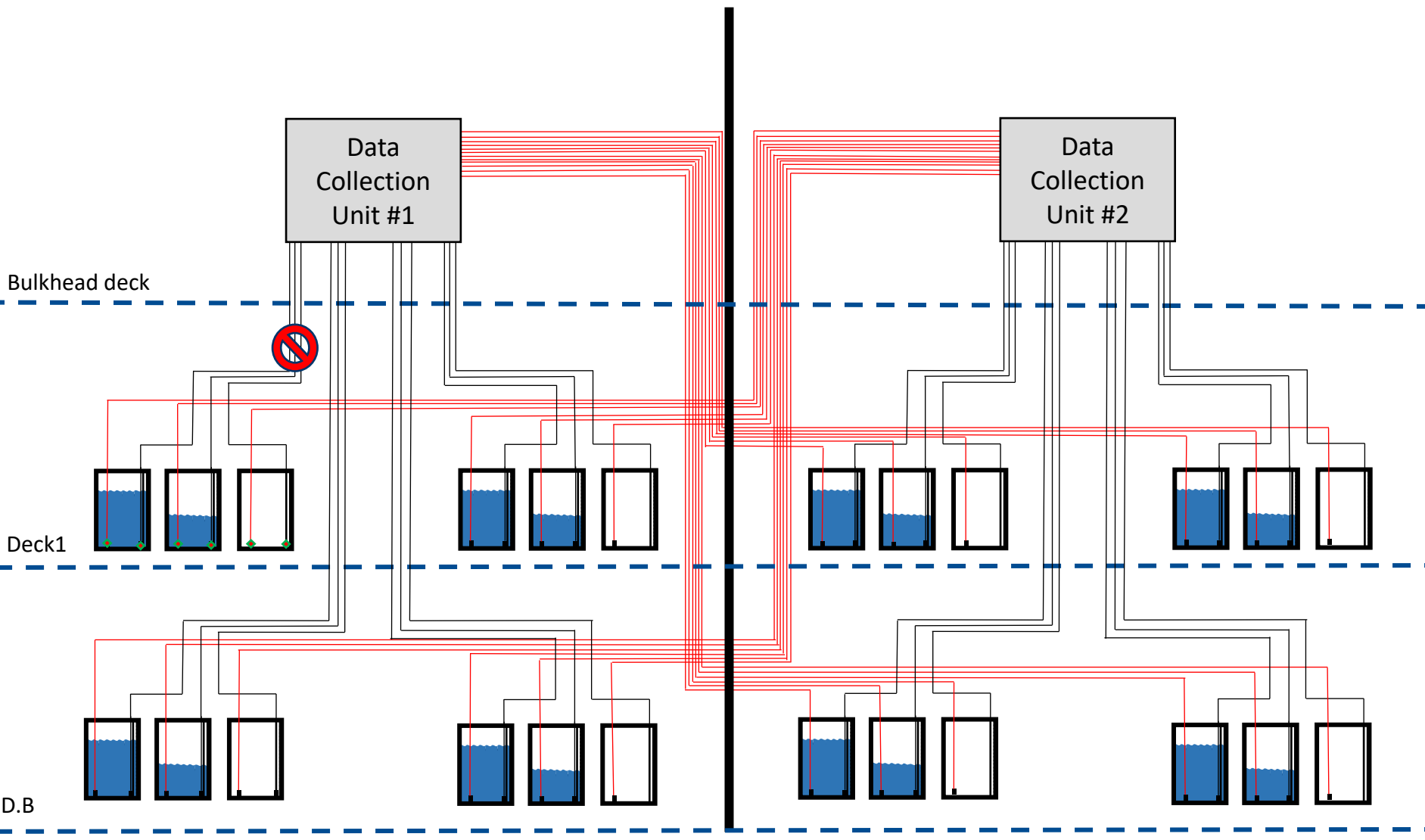
Solving the challenges of SRtP regulations for the Flooding Detection System

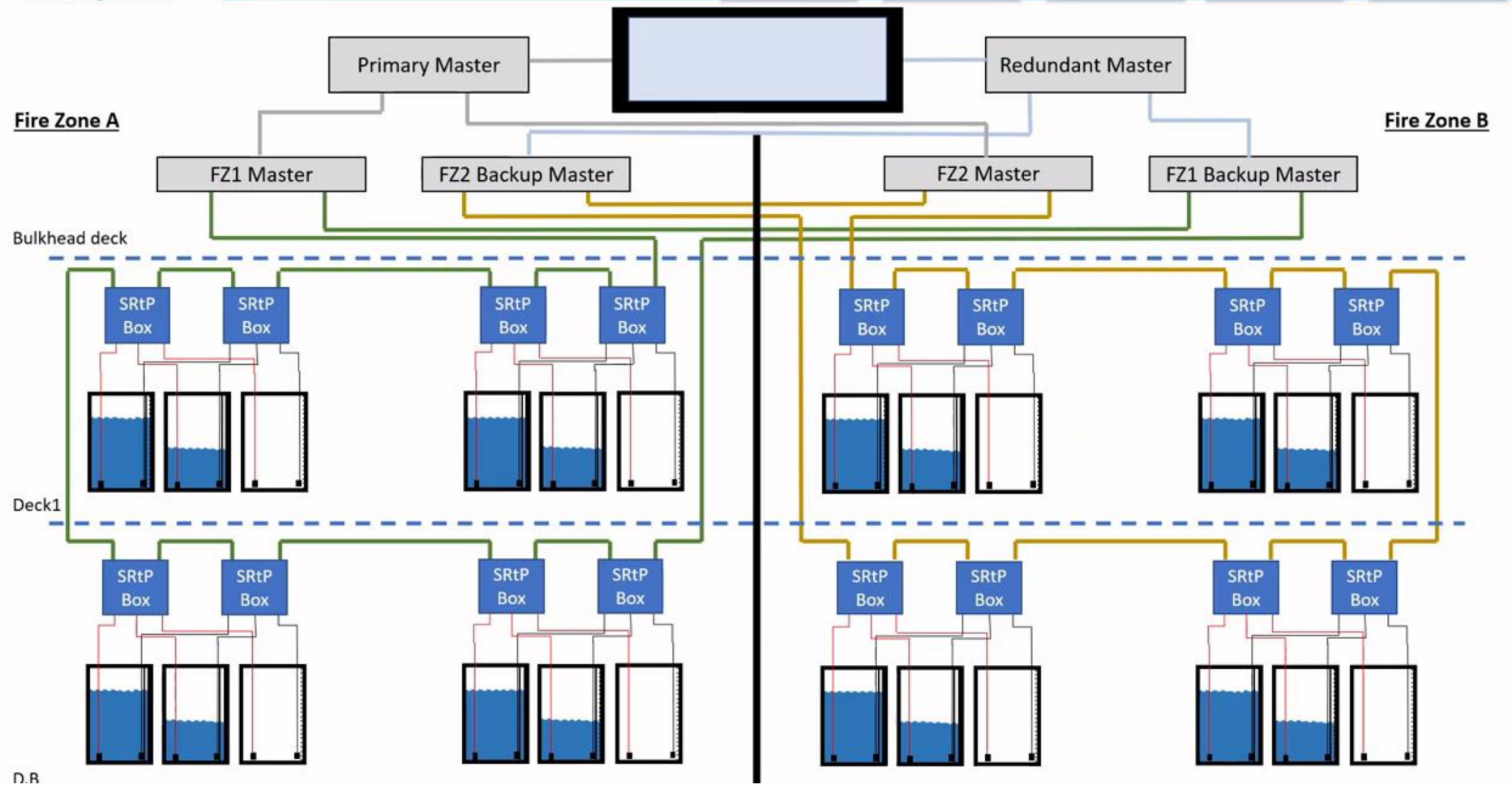


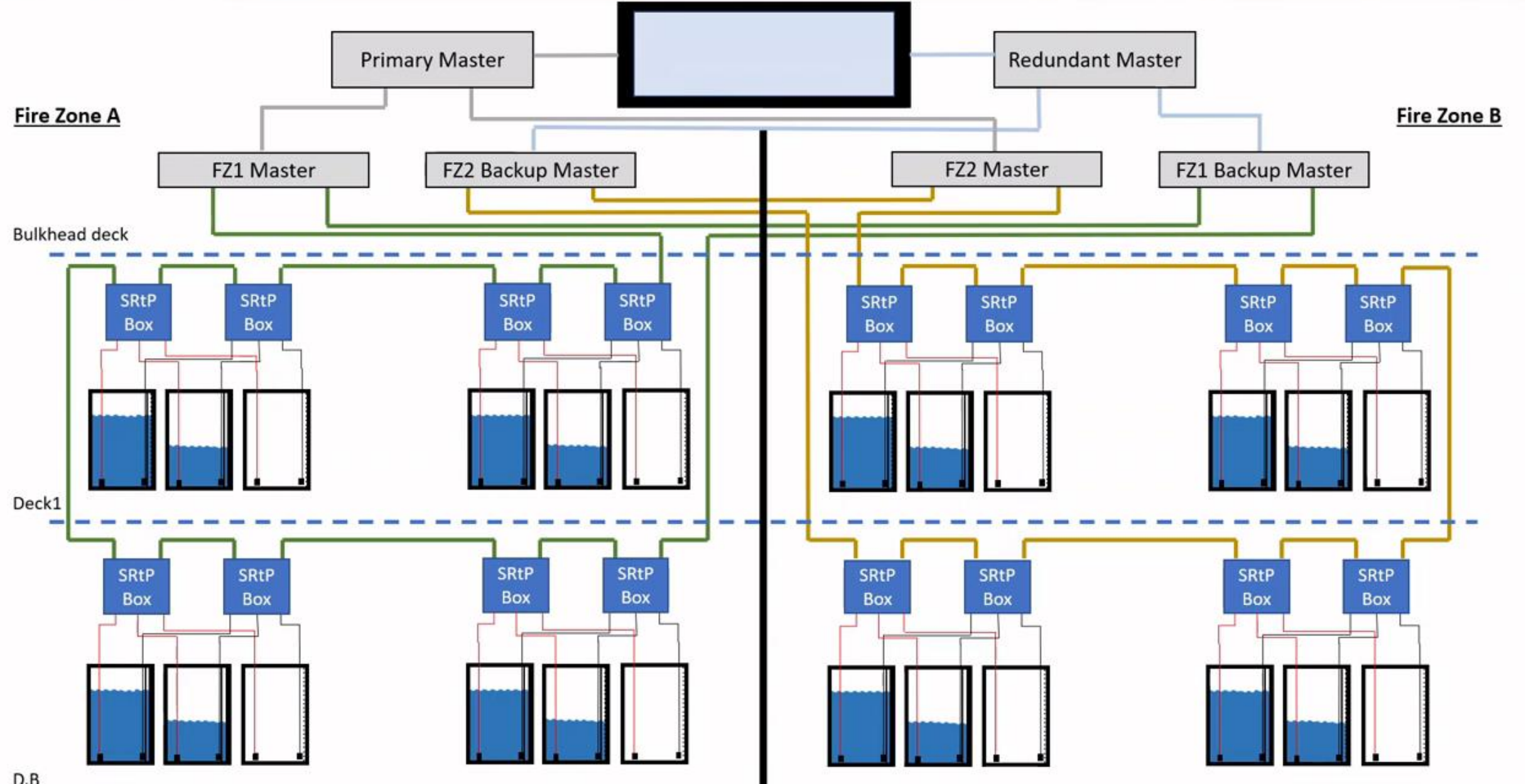
- Combining the **LevelMaster SRtP Box** and **Kockumation sensors** reduces the required amount of wiring by **~90%** compared with conventional methods.
- Flooding detection system may only be lost in spaces directly affected by fire or other damage. All other detectors shall remain operational.
- This means that each sensor needs to be connected to two different PLCs above bulkhead deck, dramatically increasing amount of wiring.

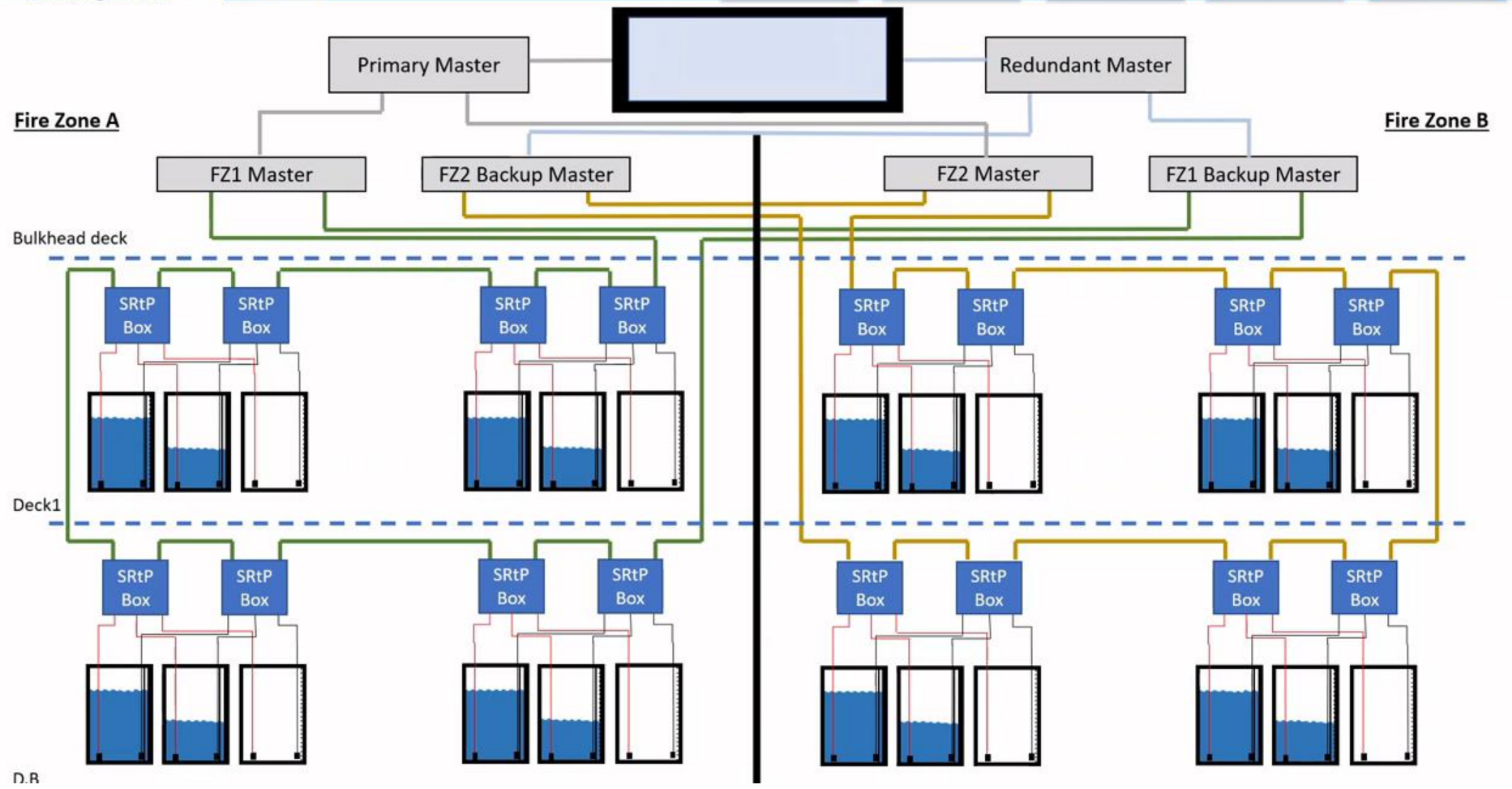
Main Vertical Fire Zone A

Main Vertical Fire Zone B









Thank you!

Loadmaster.SRTP@kockumation.com

kjt@kockumation.com

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Kockum Sonics



POLARMARINE

Texon