



Oil Spill Mutual Aid Group Society



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# **REPORT ON THE OSMAG-KPA-Total Kenya MARINE EMERGENCY RESPONSE TRAINING & TIER II DRILL CONDUCTED IN NOVEMBER 2017**

Tuesday 14<sup>th</sup> – Friday 17<sup>th</sup> November 2017

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**OIL SPILL MUTUAL AID GROUP SOCIETY**

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# 1. ABBREVIATIONS

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ABBREVIATION	MEANING
OSMAG	OIL SPILL MUTUAL AID GROUP SOCIETY
OSRAT	OIL SPILL RESPONSE ACTION TEAM
IAP	INCIDENT ACTION PLAN
NOSCP	NATIONAL OIL SPILL CONTINGENCY PLAN
OSCP	OIL SPILL CONTINGENCY PLAN
PPCO	PRINCIPAL POLLUTION CONTROL OFFICER
MPCC	MARINE POLLUTION CONTROL CENTRE
ICC	INCIDENT COMMAND CENTRE
KMA	KENYA MARITIME AUTHORITY
NEMA	NATIONAL ENVIRONMENTAL MANAGEMENT AUTHORITY
ERC	ENERGY REGULATORY COMMISSION
KPA	KENYA PORTS AUTHORITY
TOTAL KENYA	TOTAL KENYA LIMITED

# 1. ABBREVIATIONS CONT'D

ABBREVIATION	MEANING
MJT	MOMBASA JOINT TERMINAL
LOBP	LUBE OIL BLENDING PLANT
KOT	KIPEVU OIL TERMINAL
SOT	SHIMANZI OIL TERMINAL
OSC	ON SCENE COMMANDER
OSMAG TC	OSMAG TECHNICAL COORDINATOR
OSMAG TA	OSMAG TECHNICAL ASSISTANT
HFO	HEAVY FUEL OIL
HSEQ	HEALTH SAFETY ENVIRONMENT & QUALITY

## 2. SUMMARY

The marine emergency response (MER) training and drill was organized jointly by the Kenya Ports Authority, Total Kenya & OSMAG Society. The schedule of events was as follows:

<b>TUE, 14<sup>TH</sup> Nov 2017</b>	<b>ROYAL COURT HOTEL</b>	<b>CLASSROOM THEORETICAL TRAINING</b>
WED, 15 <sup>TH</sup> Nov 2017	ROYAL COURT HOTEL	Classroom theoretical training
THUR, 16 <sup>TH</sup> Nov 2017	KPA – MPCC	Equipment demonstration & Practical handling
FRI, 17 <sup>TH</sup> Nov 2017	KPA – MPCC & ON-WATER	Simulated marine Oil spill emergency drill

There were 70 participants from 24 organizations and stakeholder agencies during the classroom training. The practical equipment handling session saw an attendance of 100 delegates with the on-water equipment deployment registering about 110 participants.

The equipment deployed included: different kinds of boats such as tug boats, mooring boats and pilot boats; response equipment such as containment booms, skimmers and dispersant sprayers.

## 2. SUMMARY CONT'D

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The simulation drill exercise was based on a real time accident scenario Involving a tanker vessel carrying heavy fuel oil (HFO) for total kenya which collided with the Kipevu Oil Terminal (KOT) jetty resulting in damage on its hull and discharge of an estimated 50 metric tons of HFO into the sea.

- The Incident Command Centre (ICC) was set up at the KPA Marine
- Pollution Control Centre (MPCC).
  
- Total Kenya convened their Crisis Management Cell (CMC) at their head office, Regal Plaza, Nairobi in line with their emergency response procedures.
  
- The ICC at the MPCC was comprised of the following:
  1. The OSMAG TC who was the Incident Commander
  2. One staff from the Energy Regulatory Commission (ERC)
  3. Total Kenya's Logistics Manager, Environment Manager and the LOBP HSEQ Engineer

# 3. ACKNOWLEDGEMENTS

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The organizers extend their sincere gratitude to the Kenya Ports Authority, Total Kenya management, the OSMAG Technical staff, OSMAG Members, and the following parties/stakeholders who participated in the drill:

- 1.) The Kenya Maritime Authority (KMA)
- 2.) The Kenya Navy
- 3.) The Maritime Police Unit
- 4.) The Energy Regulatory Commission (ERC)



# 4. OBJECTIVES

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- 1) To appraise the level of emergency preparedness of OSMAG/OSRAT, KPA and the Total Kenya Crisis Management Cell (Total Kenya CMC) in the event of an oil spill crisis
- 2) Test the KPA Marine Pollution Control Centre (KPA MPCC) as an Incident Command Centre and assess the coordination between it and Total Kenya CMC
- 3) Test the Total Kenya Marine Emergency Response Plan and identify points of improvement
- 4) Test the Port of Mombasa Oil Spill Contingency and Response Plan and its application and identify points of improvement
- 5) Identify and mitigate any HSSE risks on site
- 6) To review arrangements for oil spill response among OSMAG members
- 7) Review stakeholder liaison and management during a real spill crisis

## 5. CLASSROOM TRAINING (DAYS 1 & 2)

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1) There were 70 participants from 25 organizations and stakeholder agencies. The attendance rate was 100% (70 participants out of 70 expected) which was excellent

2) The stakeholder agencies in attendance were:

3) The Kenya Maritime Authority (KMA)

4) The Kenya Navy

5) The Maritime Police Unit

6) The Energy Regulatory Commission (ERC)

7) The post training feedback forms filled by the participants indicated that 100% of the delegates agreed that the objectives of the training were met.

8) The participants rated the training as follows: Excellent - 43%, Good - 56%, Average – 2%, Poor/Very Poor – 0%

# 6. CLASSROOM TRAINING FEEDBACK

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The training met my expectations.	31	23			
2. The knowledge learned is relevant to my work as an emergency responder and will apply it.	38	15			
3. The content was organized and easy to follow.	24	29	1		
4. The trainers were knowledgeable.	33	19	1		
5. The trainers met the training objectives.	31	22	1		
6. Adequate time was provided for questions and discussion and class participation was encouraged.	22	22	8	2	
	Excellent	Good	Average	Poor	Very poor
7. How do you rate the training overall?	23	30	1		

8. What were the positive aspects about the training?
- Very knowledgeable facilitators
  - Interactive session and class participation
  - Real life examples given
  - Causes of marine spills
  - Communication
  - Health and safety awareness
9. Any other comments, suggestions, observations and recommendations?
- The venue was congested and poor ventilation
  - Increase the training time and training frequency
  - Training to be extended to Kisumu KOJ Terminal
  - Team building Activities to be encouraged

# 7. PRACTICAL EQUIPMENT HANDLING (DAY 3)

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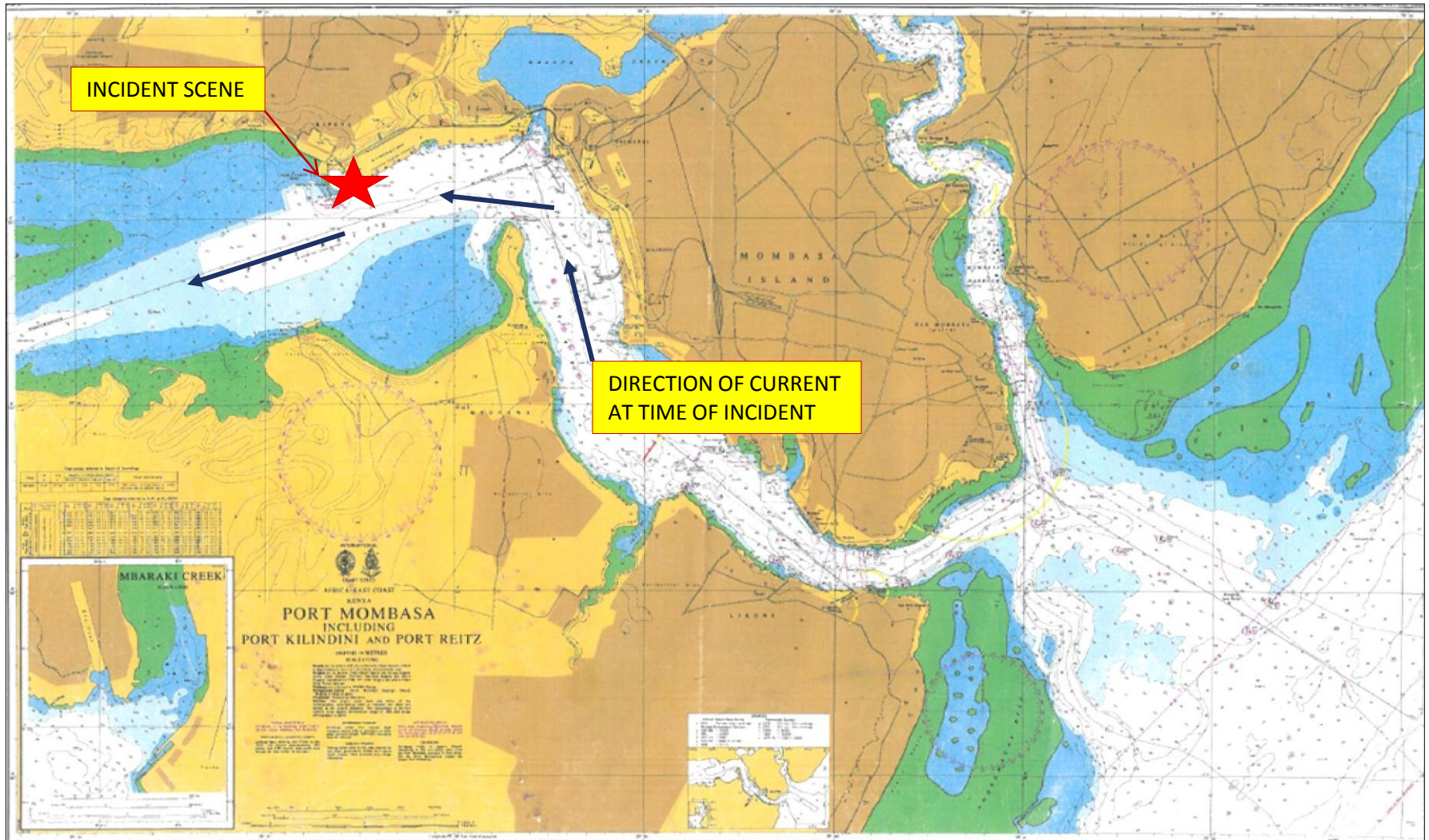
- 1.) This was held on the 3rd day (16th November 2017) at the KPA MPCC
- 2.) Delegates were taken round the equipment warehouse by the OSMAG TC.
- 3.) During the walkabout all equipment within the warehouse were shown to the delegates while relating to the classroom session learning points.
- 4.) Quick explanations were made about how some of the strategic equipment work while responding to delegate's questions.
- 5.) Delegates were then split into 3 teams: Booming, Skimming & Dispersant teams.
- 6.) The three teams were each allocated a response station consisting of the representative equipment for the team.
- 7.) For each team, a team leader was assigned who demonstrated the practical aspects of: starting and stopping the equipment, use within a spill situation, mobilization procedures for the equipment & safety during use.
- 8.) Delegates were then allowed time to practice individually the demonstrated skills to a satisfactory completion level.
- 9.) Subsequently, teams were rotated through the stations so as to have a rounded skill level.

# 8. DAY 4 DRILL SCENARIO

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- At 07:00 hours, a KPA Pilot boards a fuel delivery tanker vessel 'MT NGUZO II', 2miles east off the Kilindini channel entrance
- The vessel is chartered by Total Kenya and is carrying 80,000 metric tons of Heavy Fuel Oil inbound for Kipevu Oil Terminal (KOT)
- From 07:00hrs to 08:30, The pilot executes passage through the navigable channel on a slack tide in readiness for berthing manouvres
- At 08:30hrs, the pilot commences berthing manouvres
- At 09:15hrs, the vessel momentum is increased due to strong SS Easterly winds causing the vessel to make heavy impact with the quay. One cargo tank is ruptured above the water line. KPA firefighters on watch raises an alarm and informs vts of the emergency after noticing oil escaping into the harbor waters.
- At 09:30hrs, the vts tower informs the KPA's pollution control office of the incident.
- At 09:35hrs, the security guard at KOT contacts KPA's Principal Pollution Control Officer (KPA-PPCO) and OSMAG's Technical Coordinator (OSMAG-TC) to inform them of the incident.

# 9. LOCATION OF INCIDENT SCENE (WITHIN PORT OF MOMBASA)



# 10. EVENTS CHRONOLOGY (BEFORE ACTIVATION)

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- The four main response teams (Booming team, Skimming team, Dispersants team and On Shore Clean Up team) set up during the equipment familiarization and handling training the previous day were re-confirmed.
- Each team was allocated a trained Emergency Responder from KPA as the team leader. The KPA-PPCO was designated as the On Scene Commander (OCS) while the Total Kenya Logistics Manager-Fuels was the main Total Kenya Liaison Officer
- The following were appointed to the Incident Command Centre (ICC):-
  - OSMAG Technical Coordinator – Incident Commander & Ops Officer
  - Total Kenya Environment Manager - Historian
  - KPA Marine Operations Officer - Communications Officer
  - Total Kenya HSEQ Engineer (Coast Region) - Logistics Officer
  - Officer from the Energy Regulatory Commission - agencies representative
  - Total Kenya HSEQ Engineer (LOBP) - Safety Officer



# 11. EVENTS CHRONOLOGY (AFTER ACTIVATION)

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- Between 0900hrs & 0930hrs, the OSMAG TC briefed the teams on safety, logistical arrangements and expectations. VHF radios with pre-set channels were distributed to all team leaders, radio checked. Life jackets were issued to all teams going on board vessels.
- 0955hrs: VTS control tower calls via radio the PPCO to inform of an incident at KOT involving a vessel MT NGUZO II chartered by TOTAL. The vessel was discharging fuel oil to GAPCO Terminal 2.
- 0955hrs: The PPCO notifies the OSMAG TC of the incident and requests for response.
- 1000hrs: The OSMAG TC notifies the On-Scene-Commander (OSC) and requests for surveillance to establish facts.
- 1004hrs – Total Kenya Liaison Officer reported the incident to Total Kenya Head Office, the MJT Manager and the GAPCO Terminal 2 Manager.
- 1005hrs: The OSMAG TC notifies the OSRAT teams and puts them on standby in readiness for a possible response.

# 11. EVENTS CHRONOLOGY (AFTER ACTIVATION)

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- 1006hrs - The ICC convened and key positions are filled up.
- 1008hrs – The OSC reports back to the ICC on findings from the surveillance mission undertaken including that approximately 50 tonnes of fuel oil has been spilled and requests for support from OSRAT to help in response to the incident.
- 1010hrs – The ICC reviews the situation, escalates the response to a tier ii and approves mobilization of OSRAT teams to support the OSC as requested.
- 1011hrs 1020hrs – The ICC reviews the incident, considering the spill type & size, location, sensitivities, met-ocean conditions and the available resources and sets the following response objectives for the operational period:
  - Objective 1 – Contain the oil around the jetty in order to pool it for collection and simultaneously prevent the spread of the slick into berths 20 & 21 and towards the Mukupe and Dongo Kundu areas.
  - Objective 2 – Recover as much product as possible the pooled product
  - Objective 3 – Disperse chemically any slicks that escape the containment booms or slick already spread before placement of the containment booms to further prevent impact on mangroves and fish spawning areas.

# 11. EVENTS CHRONOLOGY (AFTER ACTIVATION) CONT'D

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- 1021hrs: The Operations section chief relays the above operational objectives to the On-Scene-Commander.
- 1022hrs - 1234hrs: The drill progresses through to completion by way of simulating the accomplishment of the stated objectives and solving the emerging practical challenges.
- 1035hrs - 1510hrs: Recovery of all equipment from the water is done, the equipment and responders are demobilized back to the base, and a hot debrief conducted at the base.

## 12. MAIN OBSERVATIONS – BOOMING TEAM

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- Mobilized from the base at 1010hrs, travelled by road to berth No. 7 and arrived at 10.15 ready to board Tugboat NYANGUMI.
- Found NYANGUMI blocked by Tug DUMA due to double berthing thereby delaying boarding by 25 minutes. Finally boarded at 1045hrs.
- Initial confusion on the team leader was witnessed which was eventually resolved by the Operations Section Chief and the OSC.
- 1110hrs: commencement of boom deployment.
- 1205hrs: Completion of deployment of a 200m boom section.
- 1225hrs: Boom recovery commenced
- 1246hrs: Completion of boom recovery
- 1351hrs: Arrival at Berth 7
- Extreme fatigue experienced among team members towards the end of exercise.
- The team reported to have had limited refreshments hampering hydration efforts.
- In general the booming activity was reported to have been a success as the entire boom section was deployed and recovered successfully without any incidents reported.

# 13. MAIN OBSERVATIONS – SKIMMING TEAM

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- 1038hrs: All equipment and personnel boarded the boat and ready to cast off
  - 1041hrs: Cast off K-Boat Pontoon for the incident site.
  - 1119hrs: The skimmer system fully deployed and started skimming
  - 1313hrs: Completed skimming operations
  - 1330hrs: arrived at K-Boat pontoon after demobilization
- 
- Entanglement of hoses was experienced during the exercise.
  - The team did not carry a temporary recovery tank to store recovered oil and had to use drums which was not efficient
  - Observed unsafe behavior by some dispersant team members who were sitting on the monkey island of the boat.

# 14. MAIN OBSERVATIONS – DISPERSANTS TEAM

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- 1020hrs: Ready for response at staging area but no boat allocated.
  - 1050hrs: boat allocated to the team however it did not have crew.
  - 1055hrs: Crew allocated, however instrumentation problems now experienced
  - 1100hrs: Cast off from K-Boat Pontoon to incident site
  - 1115hrs: arrived at the spill site, however experienced a 10-min delay due to initial inability to resolve an air lock problem in the dispersant pump.
  - 1125hrs: Dispersant team ready and stand by waiting for approvals
  - 1130hrs: ICC contacts KMA for dispersant use approval which is verbally granted
  - 1135hrs: Application of dispersant on fugitive slicks starts.
  - 1210hrs: Dispersant operations completed. 20 liters of dispersant applied
  - 1230hrs: Demobilization of the team begins
- Authority for use of the dispersants had to be obtained from KMA and NEMA in line with dispersants policy and Dispersant Policy requirements.
- The team failed to take wind direction into consideration leading to exposure of team members to dispersant due spraying against the wind.
- The team failed to carry necessary respiratory PPE.

# 15. KEY HIGHLIGHTS OF THE DRILL

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- Activation – 0955hrs,
- Deployment – within 1 hour of activation all teams deployed.
- Completion of exercise – 1234hrs, Re-assemble and debrief – 1430hrs
- Length of boom deployed – 200 meters
- Quantity of oil reportedly spilled – 50 tonnes
- Quantity recovered at Berth 20 – 1 tonnes (10%)
- Quantity recovered by booming – 7.4 tonnes (30%)
- Quantity dispersed – 4 tonnes (55%)
- Quantity of dispersants used (Ratio 1:20) - 200 ltrs
- Assumed evaporation @ 5% - 2.5 tonnes
- Quantity remaining for next operational period response - 35 tonnes

# 16. DEBRIEF OBSERVATIONS & ACTION PLAN

<ul style="list-style-type: none"> <li>Issue reported by teams</li> </ul>	<ul style="list-style-type: none"> <li>Explanation &amp; Proposed Corrective Action</li> </ul>	<ul style="list-style-type: none"> <li>By Who</li> </ul>	<ul style="list-style-type: none"> <li>By When</li> </ul>
<ul style="list-style-type: none"> <li>The KPA Port contingency plan and emergency response procedures were not availed to the ICC during the exercise</li> </ul>	<ul style="list-style-type: none"> <li>MPCC to avail KPA Port contingency plan and emergency response procedures in future exercises</li> </ul>	<ul style="list-style-type: none"> <li>KPA PPCO</li> </ul>	<ul style="list-style-type: none"> <li>ASAP</li> </ul>
<ul style="list-style-type: none"> <li>Exact location of the incident scene in terms of GPS coordinates was not precisely indicated to the ICC from the communication tower. This aids in formulation of effective response strategies based on actual slick behavior.</li> </ul>	<ul style="list-style-type: none"> <li>Plans underway to avail relevant IT equipment in the ICC room including three cameras covering the entire channel plus four TV monitoring screens</li> <li>MPCC &amp; Control Tower to consider incorporation of ICT tools such as GPS, in the ICC to facilitate more effective response.</li> </ul>	<ul style="list-style-type: none"> <li>KPA PPCO</li> </ul>	<ul style="list-style-type: none"> <li>ASAP</li> </ul>



# 16. DEBRIEF OBSERVATIONS & ACTION

ISSUE REPORTED BY TEAMS	EXPLANATION & PROPOSED CORRECTIVE ACTION	BY WHO	BY WHEN
<ul style="list-style-type: none"> <li>Commencement of the dispersant response was delayed due to absence of boat crew during initial response</li> </ul>	<ul style="list-style-type: none"> <li>MPCC to review and get to the root cause of the delay to prevent recurrence in future exercises</li> </ul>	<ul style="list-style-type: none"> <li>KPA PPCO</li> </ul>	<ul style="list-style-type: none"> <li>ASAP</li> </ul>
<ul style="list-style-type: none"> <li>The dispersant pump failed to work initially due to a reported air lock problem</li> </ul>	<ul style="list-style-type: none"> <li>Teams to be taught effective air lock prevention and removal &amp; proper priming techniques</li> </ul>	<ul style="list-style-type: none"> <li>TC</li> </ul>	<ul style="list-style-type: none"> <li>Next exercise</li> </ul>
<ul style="list-style-type: none"> <li>Extreme fatigue reported among the booming team members.</li> <li>Refreshments allocated to the team insufficient</li> </ul>	<ul style="list-style-type: none"> <li>Allocate more personnel to the booming team to allow for more relievers</li> <li>Plan for better task rotation among the team members</li> <li>Allocate sufficient refreshments to the teams in future exercises</li> </ul>	<ul style="list-style-type: none"> <li>TC</li> <li>Boomi ng team leader.</li> <li>LogM</li> </ul>	<ul style="list-style-type: none"> <li>Next exercise</li> </ul>

# 16. DEBRIEF OBSERVATIONS & ACTION PLAN

ISSUE REPORTED BY TEAMS	EXPLANATION & PROPOSED CORRECTIVE ACTION	BY WHO	BY WHEN
<ul style="list-style-type: none"> <li>The skimming team did not carry the temporary storage tank. This was attributed to lack of a crane and sufficient space on board the provided craft.</li> </ul>	<ul style="list-style-type: none"> <li>In future the temporary storage tank shall be deployed and buoyancy filled by the booming tug boat MV Nyangumi</li> </ul>	<ul style="list-style-type: none"> <li>KPA PPCO</li> </ul>	<ul style="list-style-type: none"> <li>Next exercise</li> </ul>
<ul style="list-style-type: none"> <li>Droplets of dispersants blown by wind onto response team inside the boat during the dispersants application process. Team was not kitted out to mitigate against this hazard. In case this had been a real spill, many would have suffered skin irritation and dizziness.</li> </ul>	<ul style="list-style-type: none"> <li>Consider acquisition of affordable relevant breathing PPE's such as dust masks, safety goggles to provide to the dispersants team during exercises.</li> </ul>	<ul style="list-style-type: none"> <li>KPA OSMAG</li> </ul>	<ul style="list-style-type: none"> <li>Next exercise</li> </ul>

# 17. GENERAL CONCLUSION ON THE DRILL

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- With respect to the set objectives, the drill was noted to have been successful.
- Areas requiring improvement were reviewed during the closing meeting at the MPCC, the Incident Command Centre, on the ground, and at the Crisis Management Centre at Total Kenya Head Office thereby presenting key learning's for continual improvement.
- The recommended actions to address the noted weaknesses are indicated in the summaries above.
- KPA, OSMAG & Total Kenya ought to follow up and ensure that all the recommendations made are executed as required for improvement
- The effectiveness of executed corrective actions shall be assessed during at the next deployment exercise planned for 1<sup>st</sup> half of 2018.

# 18. PHOTOS – DAY 1 & 2 - CLASSROOM TRAINING



MR. OKANGA MAKING A PRESENTATION



MR. GITAU MAKING A PRESENTATION



MS. FLORENCE MAKING A PRESENTATION



MR. BET MAKING A PRESENTATION

# 18. PHOTOS – DAY 1 & 2 - CLASSROOM TRAINING



MR. SAHA MAKING A PRESENTATION



MR. MAKHULI MAKING A PRESENTATION



MR. MBARU MAKING A PRESENTATION



MR. LILUNGU MAKING A PRESENTATION

# 18. PHOTOS – DAY 1 & 2 - CLASSROOM TRAINING



DELEGATES ATTENTIVE IN CLASS 1/4



DELEGATES ATTENTIVE IN CLASS 2/4



DELEGATES ATTENTIVE IN CLASS 3/4



DELEGATES ATTENTIVE IN CLASS 4/4

# 18. PHOTOS – DAY 1 & 2 – GROUP PHOTO



# 19. PHOTOS - DAY 3 - PRACTICAL EQUIPMENT TRAINING



MR. OKANGA EXPLAINS HOW THE BOOM WORKS



MR. MASOUD SHOWS THE RIGHT TECHNIQUE IN BOOM HANDLING



MR. OKUMU PSYCHING UP THE BOOMING TEAM



BOOMING TEAM MEMBERS HAVING A FEEL OF THE RO BOOM



# 19. PHOTOS - DAY 3 - PRACTICAL EQUIPMENT TRAINING CONT'D



MR. GITAU EXPLAINING HOW THE DISC SKIMMER WORKS



MR. OKANGA EXPLAINING HOW THE WEIR SKIMMER WORKS



MR. GITAU TAKES DELEGATES THROUGH THE POWERPACK



DELEGATES WITNESS THE WORKING OF THE DISC SKIMMER

# 19. PHOTOS - DAY 3 - PRACTICAL EQUIPMENT TRAINING CONT'D



MR. GITAU DEMONSTRATES HOW TO START THE SPRAYER



DISPERSANT TEAM WITNESS THE SPRAYER OPERATION



MR. OKANGA SHOWING THE COMPONENTS OF THE SPRAYER



MR. OYOO EXPLAINING HOW THE SPRAYER WORKS

# 19. PHOTOS - DAY 3 - PRACTICAL EQUIPMENT TRAINING CONT'D



FROM LEFT: MR. ODUOL, MR LILUNGU, MR BITAU, CAPT. WAMBILYAKEY, MR MASOUD & MR ARIMI



MR ARIMI & MR SAHA TRY ON LIFEJACKETS



MS. FLORENCE, MR. OKANGA & MR. SAHA CONFER

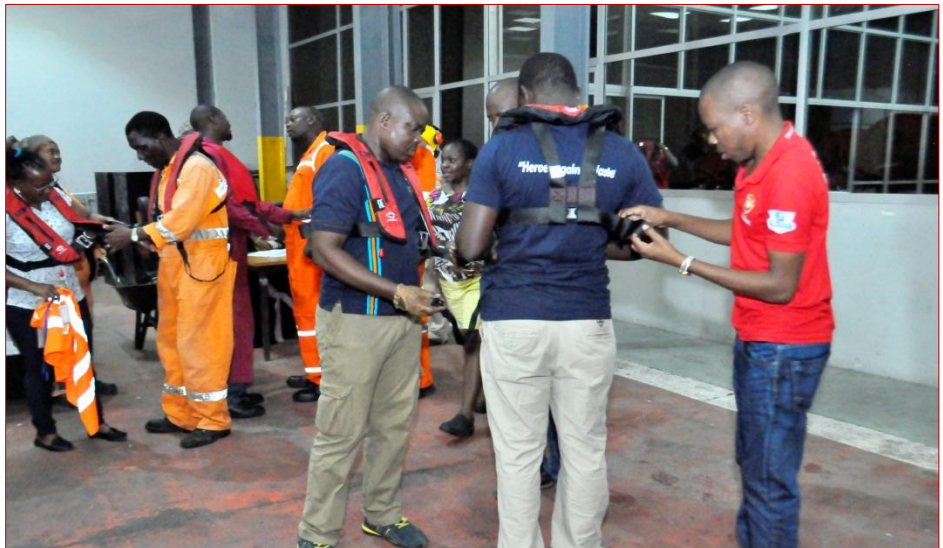


MS. FLORENCE GIVES A SAFETY BRIEF



MR. SAHA HANDLES THE AIR BLOWER HOSES

# 19. PHOTOS - DAY 4 - EQUIPMENT DEPLOYMENT



RESPONDERS DON LIFE JACKETS



MR. GITAU GIVES A PRESENTATION



MR OKANGA ADDRESSES THE REpondERS AT THE BASE



RESPONDERS WAITING TO BE DEPLOYED

# 19. PHOTOS - DAY 4 - EQUIPMENT DEPLOYMENT CONT'D



TUG NYANGUMI DEPLOYING LAST BOOM SECTION



TOWING TEAM PICKING FIRST BOOM SECTION



BOOM U-CONFIGURATION DEMONSTRATED



THE ENTIRE BOOM DEPLOYED INTO THE SEA



CLOSE UP VIEW OF THE DEPLOYED BOOM

# 19. PHOTOS - DAY 4 - EQUIPMENT DEPLOYMENT CONT'D



SKIMMING TEAM DEPLOYING SKIMMER



CAPT. WAMBILYAKEY & MR. MASOUD DIRECTING FIELD OPS



SKIMMING TEAM ARRIVE AT THE SPILL SITE



SKIMMING TEAM HARD AT WORK

# 19. PHOTOS - DAY 4 - EQUIPMENT DEPLOYMENT CONT'D



DISPERSANT TEAM UNDERWAY TO SPILL SITE



DISPERSANT TEAM SPRAYING FUGITIVE SLICKS



DISPERSANT TEAM ARRIVING AT SPILL SITE



DISPERSANT TEAM AMONG OTHERS AT THE THEATRE OF ACTION

# THANK YOU

