Comparison between A.1050(27) and MSC.581(110)

Title	A.1050(27)	MSC.581(110)
Cover page	-	References SOLAS III/19.3.6 (drills), SOLAS XI-1/7 (testing equipment) and ISM Code.
	-	Scope is extended to include port and terminal operators, port workers and operations involving shore personnel on board.
		Assembly is invited to REVOKE A.1050(27).
PREAMBLE	[Casualties are caused due to] insufficient knowledge of, or disregard for the need to take precautions rather than lack of guidance.	[Casualties are caused due to] not doing a proper risk assessments and implementing appropriate procedures.
		Organizational leadership on ship and shore to empower shipboard staff is key to implementation.
1. INTRODUCTION	References on ‘adjacent spaces’.	Introduces the idea of a ‘connected space’ and ‘adjacent space’ where a hazardous atmosphere can be present.
		Paras 1.1, 1.2, 1.3 explain about unsafe atmospheres that could occur in various spaces.
2. DEFINITIONS	‘Enclosed space’ definition has any of 3 characteristics.	Para 2.1 – Definition has any of 3 characteristics. The chapeau specifies the possibility of having a hazardous atmosphere or lack of oxygen.
	There is a non-exhaustive list of spaces.	No non-exhaustive list but another listing of spaces to emphasise that such spaces have diverse characteristic.
	‘Adjacent connected space’ has been defined,	Para 2.2 - ‘Connected space’ is defined but then for sake of clarity, more information is added - “For clarity, a space separated by a manual door, even if watertight, should be considered as "connected" as it is impossible to tell from outside the space whether it is open or closed or indeed properly sealed.”

	‘Connected space’ is not defined.	“A connected space should be treated as containing a hazardous atmosphere until testing proves otherwise.”
	‘Adjacent space’ is not defined.	Para 2.3 - ‘Adjacent space’ is defined. Based on the definition and explanation provided, every space other than accommodation block may be an adjacent space. Para 2.4 - ‘Trapped Hazardous Atmosphere’ – a new definition and requirement.
	‘Competent person’, ‘Responsible person’ explains the knowledge and authorisation requirements.	Para 2.5, 2.6 - ‘Competent person’, ‘Responsible person’: explanation is provided about having an operational level of competency and being in a management role on board respectively.
	‘Attendant’ – definition specified that this person should be suitably trained with the SMS.	Para 2.7 - ‘Attendant’ – the requirement to be suitably trained with the SMS is removed. Para 2.8 - ‘Enclosed Space Register’ – a new definition and requirement.
3. SAFETY MANAGEMENT FOR ENTRY INTO ENCLOSED SPACES	Provides an explanation of company’s responsibility under ISM Code in relation to ship-specific training, scheduling of drills and the scope of internal and external audits.	Para 3.1 – Explains the information to be included in the Enclosed Space Register. Para 3.2 – Responsibility on company to ensure that relevant information as submitted by shipper is provided in a format that is understandable to the ship’s crew and distributed to those on board who may be exposed to these hazards. Para 3.5 – mention about time pressure. Para 3.6.1 and 3.6.2 – elaborates on training requirements of competent, responsible and other crew members. Para 3.7 – “Crew members should be trained in the use of equipment necessary to facilitate rescue from an enclosed space and a record of this training should be maintained.”

		Para 3.8 – aspects to be focussed on during drills. Para 3.11 – “The company should ensure that single person entry into an enclosed space is not permitted.”
4. IDENTIFICATION OF THE HAZARDS AND ASSESSMENT OF RISK	The original title of this section was “Assessment of Risk”	This section goes into detail about the contents of the Enclosed Space Register. Para 4.3 – “The competent person's assessment should determine the potential for the presence of an oxygen-deficient, oxygen-enriched, flammable or toxic atmosphere, which includes carbon monoxide (CO) and carbon dioxide (CO_2) as well as other toxic or asphyxiant gases.”
5. AUTHORIZATION OF ENTRY	Enclosed Space Entry Permit [is to be] completed by the personnel who enter the space prior to entry.	It isn’t specified regarding who completes the permit. Para 5.2 - It is specified that the validity is never longer than eight hours. Para 5.3 – Other permits may be required depending on the job being conducted. Para 5.4 - “Shore personnel should be provided with information on the hazards associated with enclosed spaces that may be present aboard the ship.”
6. GENERAL PRECAUTIONS	Responsibility towards shore personnel is absent.	This section has been greatly expanded to include the shipboard staff’s responsibility toward shore personnel. Para 6.1 – “It is recommended that a basic schematic plan of the ship's spaces should be placed at the gangway or at other access points of the ship clearly indicating which spaces are safe to enter, and which spaces are not.”

		Para 6.2.1 – recommendation of a pre-operational risk assessment and a joint risk assessment where necessary with shore staff. Para 6.3 – “Entry doors or access hatches leading to enclosed spaces should at all times be secured against entry unless the spaces have been risk assessed, atmospherically tested as required and declared safe for entry” “The ship may use a system of seals similar to those recommended in the ISPS Code” Para 6.5.2 – “the space has been thoroughly ventilated by natural or mechanical means to remove any toxic or flammable gases identified in the hazard identification process gases;” Para 6.5.6 – “personnel entering the space are wearing personal gas detection equipment that has been properly calibrated and is capable of monitoring the levels of oxygen, carbon monoxide and any other gases identified in the risk assessment;” Para 6.6 – “The precautions in sub-paragraphs .6, .7 and .8 of paragraph 6.5 above may not be applicable to every situation described in this section.” Para 6.7 – contains training requirements for personnel. Para 6.7.2 – “an explanation of how the pace at which oxygen is depleted will increase exponentially when ventilation is stopped (fan or other equipment in case of forced ventilation, and closing a vent or damper in case of natural ventilation), or when hatch covers are closed;”
7. TESTING THE ATMOSPHERE		Para 7.1 – specifies that CO_2 testing devices should be carried and capable of operating in O_2 deficient atmosphere. Para 7.3 – “Any ship which may carry a cargo capable of generating hazardous vapours and which requires regular entry into the cargo space for cleaning and /or inspection

	Para 7.2 – gas readings. CO2 isn't mentioned and safe readings of toxic and flammable gas are mentioned to be "not more than".	should carry two sets of gas detection equipment in addition to those required by SOLAS regulation XI-1/7." Para 7.4 – gas readings now include CO_2 reading of < 0.5% by volume or 5000 ppm. The toxic and flammable gas safe readings are now "less than".
8. PRECAUTIONS DURING ENTRY	Para 8.2 – "Persons entering enclosed spaces should be provided with calibrated and tested multi-gas detectors that monitor the levels of oxygen, carbon monoxide and other gases as appropriate."	Para 8.2 – "Persons entering enclosed spaces should be provided with calibrated and tested personal gas detection instrument or instruments that monitor the levels of oxygen, carbon dioxide, flammable gases or vapours, toxic gases (including carbon monoxide), and any other gases identified in the risk assessment."
9. ADDITIONAL PRECAUTIONS FOR ENTRY INTO A SPACE WHERE THE ATMOSPHERE IS KNOWN OR SUSPECTED TO BE UNSAFE	Para 9.1 – "Spaces that have not been tested should be considered unsafe for persons to enter. **If the atmosphere in an enclosed space is suspected or known to be unsafe, the space should only be entered when no practical alternative exists. Entry should only be made for further testing, essential operation, safety of life or safety of a ship**. The number of persons entering the space should be the minimum compatible with the work to be performed."	Para 9.1 – "In preparing to enter an enclosed space, every effort should be made to ensure that it is safe to do so in order to undertake the activity required within the space. **Entry into enclosed spaces where the atmosphere is known or suspected to be unsafe requires very careful consideration, including an assessment of the hazards, residual risks and mitigations that need to be undertaken**. Spaces that have not been tested should be considered unsafe for persons to enter." Para 9.2 – "When considering the planned work activity within an enclosed space where the atmosphere is known or suspected to be unsafe, suitably designed and constructed breathing apparatus of positive pressure type should always be worn, and only personnel trained in its use should be allowed to enter the space. Air-purifying respirators, dust masks and canister face masks do not provide a supply of clean air from a source independent of the atmosphere within the space and should not be used. Emergency Escape Breathing Devices (EEBDs) are not suitable to use for entry into enclosed spaces."

		Para 9.3 – “Persons entering enclosed spaces that may contain a suspected atmospheric hazard should be provided with calibrated and tested personal gas detector suitable for the gas or gases assessed as likely to occur in the space.”
While section 9 of A.1050(27) made clear about the conditions when a person might enter into a space which is known or suspected to be unsafe i.e. for the purpose of “essential operation, safety of life or safety of a ship”, the corresponding section in MSC.581(110) now makes it clear that any planned work activity may be conducted provided a risk assessment is done and suitable barriers such as PPE and gas measuring equipment are in place.		
10. HAZARDS RELATED TO SPECIFIC TYPES OF SHIPS OR CARGO		New sub-sections: • Safety information • Enclosed hold access trunks • Working spaces with connections to cargo holds • Hazards related to steel • Specific dangers associated with carbon dioxide (Para 10.5.3 – “The atmosphere in the space will be harmful to life, not only due to oxygen deficiency but that also because of the toxic concentration of carbon dioxide.”) (Para 10.5.8 – “A carbon dioxide or other toxic gas laden atmosphere "looks normal" as there is no sensory indication to cause alarm regarding the dangers within the enclosed space.”) • Information on acceptable and unacceptable levels of gases
Toxic concentration of CO_2 is mentioned but the limits are not specified. Later, a metric of 5000 ppm is used as 8 hour TWA. No scientific basis of the toxicity of CO_2 is provided.		
11. ACTION TO BE TAKEN IN THE EVENT OF AN EMERGENCY	Section absent	New section introduced as an addition to Section 9 to specifically deal with rescue. Para 11.5.1 – wrt Equipment to be provided for the ship's crew to utilize in the event of an enclosed space accident: “Equipment to test and verify the enclosed space atmospheric conditions and determine the hazards to life and the mitigations necessary prior to entry;”

This section is meant to address situations where rescue from an enclosed space would be required. It suggests testing the atmosphere of the space where a casualty might be present and completion of section 3 of the Enclosed Space Entry Permit. Personnel entering the space for the purpose of conducting a rescue operation need to wear personal gas meters.		
12. CONCLUSION	"Failure to observe simple procedures can lead to persons being unexpectedly overcome when entering enclosed spaces. Observance of the principles and procedures outlined above will form a reliable basis for assessing risks in such spaces and for taking necessary precautions."	"Failure to systematically identify the hazards of a space and the risks associated with entry can rapidly lead to fatality inside the space. Rigid observance of the principles and procedures outlined above will provide a reliable basis for assessing the risks of entering such spaces and taking the necessary precautions to counter the danger."
APPENDIX	**EXAMPLE OF AN ENCLOSED SPACE ENTRY PERMIT**	
APPENDIX 1		**EXAMPLE OF AN ENCLOSED SPACE EMERGENCY RESPONSE PLAN**
APPENDIX 2	**Section 3 – BREATHING APPARATUS AND OTHER EQUIPMENT** Note 1. "The permit should contain a clear indication as to its maximum period of validity" Note 3. "Tests for specific toxic contaminants, **such as benzene or hydrogen sulphide**, should be undertaken depending on the nature of the previous contents of the space."	**EXAMPLE OF AN ENCLOSED SPACE ENTRY PERMIT** **Section 3 – Entry into a space where the atmosphere is known or suspected to be unsafe** Note 1. "The permit should contain a clear indication as to its maximum period of validity. As a default, the maximum period should be eight hours. If persons exit the space and leave it unattended this voids the Permit and a re-inspection is required" Note 3. "Tests for specific toxic contaminants should be undertaken depending on the nature of the previous contents of the space." (**Benzene and hydrogen sulphide not specified**).
APPENDIX 3		**EXAMPLE OF AN ENCLOSED SPACE WARNING SIGNS**

APPENDIX 4		**STEEL RELATED EXPERIMENTS – TABLE OF FINDINGS**
APPENDIX 5		**INFORMATION ON ACCEPTABLE AND UNACCEPTABLE LEVELS OF GASES** Section on CO2 does not provide information on toxic level of the gas; only asphyxiant levels are detailed.