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A COMPARATIVE STUDY ON INDOOR AIR QUALITY (IAQ) BETWEEN CENTRALISED AND SPLIT UNIT AIR CONDITIONING SYSTEMS IN A NAVAL SHIP

(2024) *Defence S and T Technical Bulletin*, 17 (1), pp. 28-36.

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Abstract
This study determines the compliance of indoor air quality (IAQ) in areas served by different heating ventilation and air conditioning (HVAC) systems in a naval ship, namely centralised and split unit air conditioning systems. A total of nine IAQ parameters, which include physical parameters (temperature, relative humidity (RH) and air movement (AM)), chemical parameters (formaldehyde (CH2O), particulate matters (PM10), total volatile organic compounds (TVOC) and carbon dioxide (CO2)) and biological parameters (total bacterial count (TBC) and total fungal count (TFC) were assessed using calibrated handheld IAQ devices at ten different areas in the ship. The results show that the percentage of compliance is higher in areas served by centralised air conditioning systems as compared to split unit air conditioning systems. The Mann-Whitney test (p-value < 0.05) shows significant difference between the centralised and split unit air conditioning areas for all the IAQ parameters except for temperature. These findings indicate that centralised air conditioning systems, which can introduce fresh air into their served areas contribute to the decrease of concentration of chemical and biological parameters, provided that the units are well maintained.

Author Keywords
centralised and split unit air conditioning; Indoor air quality (IAQ); indoor air sampling; Mann-Whitney test; naval ship

Publisher: Science and Technology Research Institute for Defence

ISSN: 19856571
Language of Original Document: English
Abbreviated Source Title: Def. S T Tech. Bull.
2-s2.0-85188176874
Document Type: Article
Publication Stage: Final
Source: Scopus