Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

PEM05-34 会場:303 時間:5 月 21 日 16:45-17:00

航空機運航中における宇宙線被ばくと宇宙天気情報
Cosmic-ray exposure and Space weather information during aircraft operation

浅田 和秋 [1*]
Kazuaki ASADA[1*]

[1] 日本乗員組合連絡会議
[1]Airline Pilots' Association of Japan

Effects of exposure to cosmic-ray during aircraft operation are divided into exposure of aircrew and operational impact.

International Commision on Radiological Protection (ICRP) issued a recommendation to include occupational exposure of aircrew with a jet operated exposure from natural radiation source in 1990. Radiation Council consists of the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Health, Labour and Welfare, the Ministry of Land, Infrastructure, Transport and Tourism estabilised "Guidelines for management of aircrew exposure to cosmic radiation" in 2006. In response to this, airlines keep record of assessed doses on each aircrew using Japanese Internet System for Calculation of Aviation Route Doses (JISCARD-EX) developed by National Institute of Radiological Sciences (NIRS).

Impacts of space weather on aircraft operations can be classified into communications and navigations.

For communicaton, it includes difficulties on HF radio due to Dellinger Phenomenon while flying out of range of VHF coverages as international flight. And also includes difficulties on SATCOM voice communication and Controller Pilot Data Link Communication (CPDLC) in oceanic region.

Modern navigation by Global Navigation Satellite System (GNSS) is becoming mainstream. GNSS are used all phase of aircraft operation during on the ground, depareture, en-route, and approach. Future of operations aim high category precision approach using automatic approach and landing by GNSS even extremely low visibility until stop on runway. Cosmic-ray re-write the data in memory known as soft error on electronic equipment onboard aircrafts.

Use of Space Weather forecast, how to provide the information to aircrew and how to make decisions are urgent consideration.

For these problems International Airways Volcano Watch Operations Group (IAWOPSG) which one of operations group of International Civil Aviation Organization (ICAO) is making draft "Concept of Operations (ConOps) for international space weather information in support of international air navigation". Adoption of ConOps is targeted for ICAO/WMO divisional meeting in 2014.