

COSMIC RADIATION DOSIMETRY IN INTERNATIONAL FLIGHTS OF ARGENTINE AIRLINES

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INTRODUCTION: In Commercial Aviation the most important determinants of radiation exposure in humans are the altitude, latitude, flight duration and the solar cycle's period. This study was conducted to address this type of exposure through radiation dosimetry.

METHOD: The study was performed in the business-class cabin of an Airbus 340-200 aircraft, provided by Argentine Airlines, during 2 flight routes: New York-Miami-Buenos Aires (transequatorial) and Buenos Aires-Auckland (circumpolar). Measurements addressed the electromagnetic spectrum or low Linear Energy Transfer (LET) and corpuscular radiation (High LET). The instruments used were an Ion Chamber (IC), to measure the ionizing component of radiation (i.e., gamma radiation), the SWENDI, to measure only the neutron component, and the Tissue Equivalent Proportional Counter (TEPC) for measuring all radiation types. **RESULTS:** The routes' dose rates are presented in the table. TEPC rates agreed with the LET findings. The total dose rates of high latitude flights were higher than those of low latitude flights. The SWENDI (High LET) results for the flights over the equator, at low latitude, represented only 1/3 of the total radiation. The New York-Miami and Buenos Aires-Auckland flights, at high latitude, represented just under 1/2 of the Total radiation (-45%). **CONCLUSION:** Based on the results of this study, the annual dose rates of radiation exposure of aircrew personnel serving on international flights offered by Argentine Airlines is between 3 and 7 mSv. This rate is higher than the maximum recommended for the general population by the International Commission on Radiological Protection (ICRP), which is 1 mSv/y. Therefore, these personnel must be officially considered "Occupationally Exposed to Radiation" in way to provide the appropriate measures that must be implemented for their protection in accordance to ICRP guidelines.

ROUTE	Dose (uSv)		
	IC	SWENDI	TEPC
NY-Miami	6.07	5.07	11.04
Miami-B.A.	12.2	6.73	15.65
B.A.-Auckland	31.3	25.87	55.8