Engineering Heritage Australia

National Engineering Oral History Program

Biographical Notes

Professor Brian O'Keeffe (1934 -)
Electrical Engineer

Birth & Family: Born 1 February 1934, Gympie, Queensland. Youngest son of Cornelius Daniel O'Keeffe and Thelma May O'Keeffe nee Du Rietz Three siblings = Dan, John and Paul O'Keeffe

Education: Attended St Joseph's College, Brisbane, Queensland, primary and secondary schooling. Completed high school in 1951 at age 17. Attended University of Queensland undertaking an engineering degree – in electrical engineering, with distinctions in Maths, Control Theory and Electrical Design. Awarded B.E., University of Queensland in 1956

Qualifications: Bachelor of Engineering (Electrical), University of Queensland (1956); Doctor of Laws *honoris causa*, Monash University (1998)

Memberships: Fellow of the Institution of Engineers, Australia (FIEAust) (1993); Honorary membership, Royal Institute of Navigation of UK (1994); Fellow of the Institute of Navigation, Australia (1997)

Awards: Certificate of Commendation from the US Federal Aviation Administration (FAA) (1990); Officer in the Order of Australia (1992); Special Medallion of the Air Traffic Control Association of USA (1992); Aviation Week's Aerospace Laureate in Electronics (1995); CAA Chairman's Commendation (1995); Special Commendation from the Air Traffic Control Association, USA (1996); Award from the Civil Aviation Authority of Singapore (1997); US FAA's Award for Distinguished Service (1997); Clifford Burton Medallion from the US Air Traffic Control Association (1997); Hall of Fame, Air & Space Musuem, Smithsonian, Washington, USA (1997); US Institute of Navigation's Capt. PVH Weems Award (1998); Canberra Engineering Hall of Fame (2002); ICAO's Edward Warner Award (2004)

Uni. Work Exp: University work experience included: heavy engineering firm of ship builders and repairers, Royal Australian Electrical Mechanical Engineers and the Dept. of Civil Aviation at Eagle Farm airport, Brisbane.

Work History: Offered position of Engineer Class 1 on graduation from University of Queensland with the **Department of Civil Aviation's (DCA)** Regional Office, Brisbane. Commenced work in February 1956 – designed and supervised radio installations, converted WW2 equipment to civil aviation use; lectured in Metallurgy at Central Training College, Brisbane. Seconded to University of Adelaide in 1957 to assist Prof. Willoughby in Navigation Aids research, sponsored by DCA. Began working on designs using transistor technology and working with digital computers.

In 1959 transferred to Melbourne (DCA Head Office) to Navaids Branch as Engineer Class 2. Conducted training courses for engineers, used digital computer at Monash University to analyse ILS (instrument landing system) antennas and designed a new ILS antenna system; also designed ILS monitoring systems and flight calibration systems. Carried out maintenance tasks on ILS Australia-wide and Port Moresby. Appointed Project Engineer to evaluate new ILS-based All Weather Landing Systems. In conjunction with the Air Navigation Group at Sydney University (sponsored by DCA) involved in setting up a unique ILS model range and development of new ILS antennas. Co-developed a high accuracy optical/electrical system for tracking aircraft.

Promoted to Engineer Class 3 in 1965. Began reporting on navigation systems to ICAO (International Civil Aviation Organisation), a technical agency of the United Nations located in Montreal, Canada. Subsequently appointed Australian member of ICAO study group to update the manual on Testing of Navaids. Wrote paper proposing the development of a new landing system (later called MLS – Microwave Landing System) for ICAO All Weather Operations Panel in 1967. Promoted to Engineer Class 4. Began experimental work of satellite systems; set up facility at Melbourne Airport; carried out ranging measurements to the ATS-1 experimental satellite (similar to the use of Global Positioning System, GPS today); set up simulations of aircraft, developed new low-cost navigation system and built the prototype instrumentation for the aircraft which was copied into production.

Promoted to Class 5 Engineer in 1971; DCA became part of the Department of Transport (DOT) in 1973. Led national and international development of MLS and was responsible for managing the DOT's MLS program. Coordinated the technical resources of DOT, CSIRO, Sydney University, AWA, to design, build, test and report on a complete MLS to ICAO – this involved using "technological diplomacy at the international level". ICAO adopted the Australian signal format in 1978. Participated in plans and part of the public debate for the Omega Navigation Station in Australia.

Promoted to Senior Assistant Secretary, Planning Research and Development in 1975 (SES Level 2, Branch consisted of 86 professional engineers and a capital works budget of $8m). Appointed to the Government's Task Force on National Communications Satellite System in 1977. Appointed Study Team Leader for the Domestic Air Transport Policy Review, produced the results in a 450 page report. Acted as Regional Director, NSW Region for two months in 1980.

Appointed First Assistant Secretary Airways Operations Division, Canberra, 1980 (SES Level 3). Responsible for Air Traffic Controllers, Flight Service Officers, Airport Rescue and Fire Fighters, Aviation Security and Aircraft Noise – first case of an engineer appointed to such a position.

In 1982 appointed First Assistant Secretary Airways Division (SES Level 4 of the new Airways Division). Directly responsible for the management of approx. 300 staff in Central Office and 6,000 Airways staff Australia-wide. Became the Australian member of ICAO's Special Committee on Future Air Navigation Systems (FANS). Acted as Deputy Secretary in 1987 during transition from Dept. of Aviation to Dept. of Transport and Communications.

Civil Aviation Authority (CAA) in established in 1988, appointed General Manager Advanced Systems Development with greater involvement in international civil aviation systems, including the FANS Committee. Involved in PET (Pacific Engineering Trials) to demonstrate Automatic Dependent Surveillance (ADS) in collaboration with US and Japan. Developed FANS1 package, certified in 1995. Also involved in Government's consideration and approval of a 3rd runway for Sydney Airport in 1989. Reorganisation of CAA in 1991, appointed General Manager, Research and Development and ICAO. Air Services Australia formed in 1995, appointed General Manager, International and ICAO. Worked as Special Technical Adviser to new CEO. Retired in mid-1997.

International working career and involvement in ICAO: participated in study groups, panels, committees, regional groups, divisional meetings, special and general assemblies. Established close relationships with staff of civil aviation authorities and aviation industries throughout the world. Nominated in 1984 as the Australian representative of the Special Committee on Future Air Navigation Systems (FANS); elected Vice Chairman in 1985. The FANS Committee developed an integrated communication, navigation, surveillance and air traffic management (CNS/ATM) system; task completed in 1988. Elected in 1988 to lead the interim Committee to take it forward and when ICAO established the Phase 2 Committee was elected its Chairman. System accepted at a worldwide meeting of ICAO in 1991; developed detailed institutional arrangements and the global coordinated plan. Received personal briefing on GPS at a special Pentagon meeting. Completed Phase 2 task in 1993. Participated in ICAO Legal Committee meetings on technical aspects of FANS CNS/ATM. Elected First Vice President

of the ICAO General Assembly in 1992. In 1992 became the Australian member of the newly formed Asia/Pacific Air Navigation Planning and Implementation Regional Group.

Since 1992 organised and lectured at annual seminars at the Singapore Aviation Academy.

Elected First Vice Chairman on the Asia/Pacific Regional Air Navigation Meeting in 1993. In 1996 nominated by Australia as technical expert on the ICAO Panel of Legal and Technical Experts to establish a legal framework in relation to GPS. In 1996 became a member of ICAO's CNS/ATM Implementation Advisory Group; member of the US Government/Industry Free Flight Steering Committee (1995-1998); In 1997 invited to make a presentation on FANS to the US Vice President's White House Commission on Aviation Safety and Security. Presented numerous papers on CNS/ATM to worldwide technical organisations.

In 2001 invited to be Patron of the Australian Global Positioning Systems Society Inc.

Other Work Activities:

University of Canberra: Appointed Adjunct Professor in Communication Engineering in 1995. Organises lecture series for 2nd and 3rd year students on Engineering Management. Lectures 4th year students on an aviation design project. Participates in research work on satellites and related topics. For the Marconi centenary celebrations in December 2001 reconstructed and demonstrated the apparatus used by Heinrich Hertz in 1887 for the first unambiguous demonstration of the transmission and reception of electromagnetic waves.

FANS PLANS P/L Consultancy: Upon retirement from the public service in 1997 established own consultancy to provide high level advice on the planning and implementation of FANS CNS/ATM. Has consulted to a variety of government and industry bodies, such as Honeywell (USA), Airports Fiji Ltd and the Australian Civil Aviation Safety Authority. Other contracts include: examining the performance of GPS receivers for aviation in Australia for the Government's Industry Strategic Air Traffic Management Group; still involved in organising and lecturing at CNS/ATM seminars at the Singapore Aviation Academy.