FOCUS ON COMBINED HAZARDS

AN aircraft was being given radar vectors for an ILS approach. Surface weather conditions were ceiling 400ft; visibility seven miles in light drizzle; temperature, 34°F, and dew point 30°F. Four miles from the outer marker at 2,500ft the crew found it impossible to control the aircraft, and said they would try another approach. Clearance was given to turn right and maintain 2,500ft; at this time the crew reported at 1,500ft whereupon they were warned of obstructions and instructed to climb to 2,500ft. The aircraft radar target left the localizer course and the crew reported "very bad air, very bad, we're almost down." Moments later they reported at 800ft; there were, a *Flight Safety Focus* report says, no further communications from the aircraft, which disappeared from the radar.

The aircraft struck the ground in a flat open area. Examination of the flying surfaces some 90min after the accident showed an accumulation of mixed rime and clear ice the base of which was about three-eighths of an inch thick, with many one inch projections. There were no indications that de-icing action had been taken.

Before this approach a jet aircraft had flown over the intended track some three miles ahead and 1,000ft higher. Considering the atmospheric conditions prior to the accident, the velocity within the jet's vortex trails one minute after the vortex was shed would be 600ft/min and the vortices would be moving downwards at 265ft/min.

The severe buffeting and difficulty experienced in maintaining lateral control by the lower aircraft indicates that the jet's vortices had settled into the flightpath. Even at this point, the turbulence could still cause the aircraft to make an abrupt roll with subsequent loss of altitude.

Making things more difficult on this occasion was the fact that air temperature was below freezing level between 1,000ft and 2,500ft. The crew did not recognize the icing situation and did not correct for the increase in stalling speed which resulted. The pilot, having therefore become confused by the vortices, failed to account for the effect of, and unknown accumulation of, airframe ice and the consequent effect on performance.

GUERNSEY'S NEW RADAR

ON May 27 Plessey Radar handed over the first civil installation of its AR-1 radar to the Guernsey Airport Authority. A commemorative plaque was presented on behalf of Plessey Radar by Mr Dick Haynes, the general manager, to Mr E. D. Collas, President of the States of Guernsey, who accepted it on behalf of the States.

The AR-1 radar is likely to be kept very busy, because radar (hitherto Decca 424, use of which will continue) has been used for one in six of all approaches at Guernsey, which has recorded 20,000 movements per annum. At peak periods traffic densities exceed those at London Heathrow.

Installed to cover a range of 75 miles gap-free to very low altitude, the new equipment makes it possible to survey all aircraft in the area. It also relieves Jersey of much of the workload, increases safety and extends the service to Alderney.

Three years ago a market survey revealed a gap for a high-accuracy/data radar for terminal airfields to bring aircraft into the GCA pattern; identify low-level outbound traffic; control finals (PPI); monitor aircraft using parallel runways; control high-density adjacent airfields; and integrate civil and military traffic, especially in connection with the recovery of fighters. The system is also designed for high altitudes (40,000ft at 40 miles) and fast let-downs.

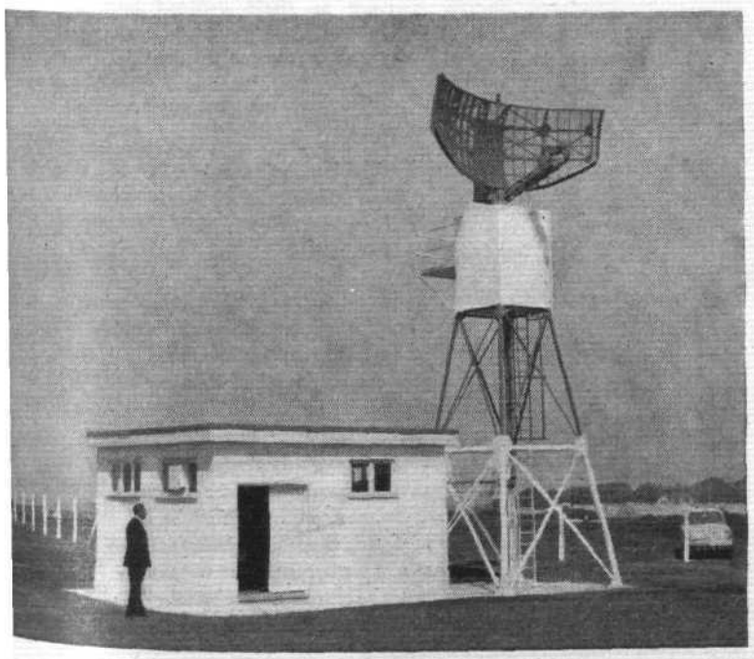
A special feature of the AR-1 is that it provides S-band renewal 15 times per minute. It also offers weather suppression, permanent echo suppression (which can be reintroduced at any desired intensity if required), transistorized MTI and circular polarization.

As can be seen from the photograph, the installation is compact and offers ease of siting. It is delivered *à la* Meccano and is quick to erect; the Guernsey AR-1 was installed and working in six weeks.

The basic cost of AR-1 radar is £50,000, but with refinements may be around £100,000. Orders total approximately £2m and another £2m worth are nearing completion. Among countries that have placed orders are New Zealand and Hungary; other customers are in Europe, the Middle East and Africa. AR-1 is to be installed at London Airport this year.

Plessey claim that this is a new breed of civil radar and that it has applications throughout the whole of the civil aviation field.

The newly installed Plessey AR-1 radar at Guernsey Airport. See story on this page



NEW THOUGHTS ON FIRE-FIGHTING

THE National Fire Prevention Association, at their 69th annual meeting, heard Mr D. W. Conley of the FAA discuss the use and misuse of helicopters in the airfield fire-fighting role. Mr Conley reported that the helicopter's downwash could be effective in beating back flames to extend escape time only if the fires were upwind of the fuselage.

Tests were described in which the FAA set fire to several C-97s which were slightly altered to resemble passenger types and instrumented to measure temperature and toxic gases. JP-4 fuel was burned for several minutes at rates of up to 1,000gal per minute. Firemen took an average of 140sec to gain control of the fires using 1,800gal to 3,000gal of water-foam mixture for each side of the aircraft.

Helicopter downwash could also aid the safe withdrawal of escaped passengers, by cooling a 30ft-wide rescue path. Without the downwash, gusts would blow flames into the path. The downwash would not cut a path through areas wetted with fuel, but would prevent the spread of flames to unwetted areas. Mr Conley also suggested that less inflammable interior trimmings would further reduce post-crash fires.

Mr Ryan, of the FAA, emphasized the need for good helicopter-fire-truck communications, and suggested that the helicopter would give the fire-captain a much better view of proceedings. Careful approach to the burning aircraft was needed when the fire was downwind, to prevent overheating and mushing into smoke and flames, the best hover-height being 80ft ±10ft. He believed limiting factors to be the plastic windscreen and the recirculation of smoke and gases. Mr Ryan said that on one test the windscreen had softened and bent, but that this might be cured with a reflective film on it, and internal cooling fans. The pilot could also use a coloured radiation visor.

Mr T. W. Bridges, also of the FAA, pointed out that downwash could remove foam from fuel pools resulting in backflash fires, and could also spoil the aim and range of the foam stream leaving the fire-truck turret. Firemen might need goggles to protect them from dust.

Mr J. E. Lodge, from the Ministry of Aviation, reported to the meeting about research into aviation bad-weather fire-fighting. Sonar devices were being tried to improve vehicle navigation and to prevent collisions in fog on airfields. Trucks of better performance were also being acquired, the first one of which would go into service at London Airport later this year.

Another delegate, Mr A. B. Nehan, said that a special effort was being made to eliminate false fire warnings, that a new system had been installed on A4-E aircraft, and that no false warnings had been experienced to date.