

# Case Study 1

## Australian Defence Force Academy

The Australian Defence Force Academy (ADFA) was established in the Canberra suburb of Campbell in 1977, to integrate cadet training of the three arms of the Australian Defence Force. In 1981 the Commonwealth signed an agreement with the University of New South Wales to set up a college within the Defence Academy, which would guarantee the academic integrity of the Academy; establishing itself as one of Australia's most respected universities with world class research facilities and an international reputation for outstanding academic programs.

### The Project

The ADFA Cadet's Mess is designed to seat 1,000 people and cater for up to 1,200 cadets at any one time. The Cadet's Mess comprises food preparation areas, kitchens, dining areas, bars, recreation areas and a shop. The Defence Energy Efficiency Program (DEEP) identified a range of energy saving opportunities, which included upgrading the existing lighting in the Cadet's Mess with an integrated lighting solution.

### The Challenge

The lighting in the Cadet's Mess consisted of High Intensity Discharge (HID) with 80W luminaires, operating continuously for a large part of the operational day. In addition the building featured a large number of skylights providing natural light into the building.

The challenge was to upgrade the existing high power light fittings with more efficient luminaires, maximise the use of natural light and schedule lighting to coincide with the operational use of the building, while delivering energy and cost savings.

### The Solution

The 80W HID lamps were replaced with compact fluorescent downlights, supplied with an electronic ballast, with a total power consumption of 42W. The downlights featured a multi faceted reflector surface, that provided a higher lighting spectral efficiency compared with the HID lamps. The use of compact fluorescent lamps also overcame the start up delay associated with HID luminaires.



Additional savings and control flexibility resulted with the integration of a C-Bus lighting control system, as part of this lighting solution. Daylight harvesting sensors were used to measure the natural ambient light and in turn automatically control electric lighting, achieving an energy saving of up to 50 per cent.

Since meal times and events held in the Cadet's Mess were well defined and predictable, C-Bus was used to automatically schedule lighting to only come on when the facility was occupied. In addition, lighting zones were created in smaller areas which were manually switched by cadets, without requiring all the lighting to come on, further enhancing energy savings.

### The Savings

From the onset it was estimated that electricity usage would be reduced by 316,940 kWh per annum, while greenhouse gas emissions reduced by 335 tonnes with an annual cost saving of \$28,525.

The integrated solution resulted in a positive response from the users and the Defence Academy. The indoor environment quality was improved by reducing over-illumination from electric lights and maximising the benefits of natural lighting.

### The Facts

Energy savings	316,940 kWh
Annual greenhouse gas savings	335 tonnes
Annual energy cost savings	\$28,525