# Integrated Vessel Automation Systems

INTRODUCTION

Advanced Control provides turnkey solutions for Integrated Automation systems utilised for purpose built Vessels Using the latest commercially available automation hardware and software is the best strategy for reducing both costs and risks in the life cycle of an automation system. This is characterised by the use of Open Control Systems. Being an independent system integrator, Advanced Control AS is not committed to any particular equipment suppliers and use a variety of hardware and software for our MMI and PLC systems.

ADVANCED CONTROL'S CAPABILITY

As well as being an independent system integrator and one of the companies with personnel trained in the use of open systems, AC-personnel also have the benefit of an extensive history in the Automation Industry.
For any given system, AC can set its scope and tailor the architecture to suit the client, including the communication network and the redundancy requirements.
AC's solutions are based on open systems such as PCs, MS Windows, TCP-IP, and the Citect display software.
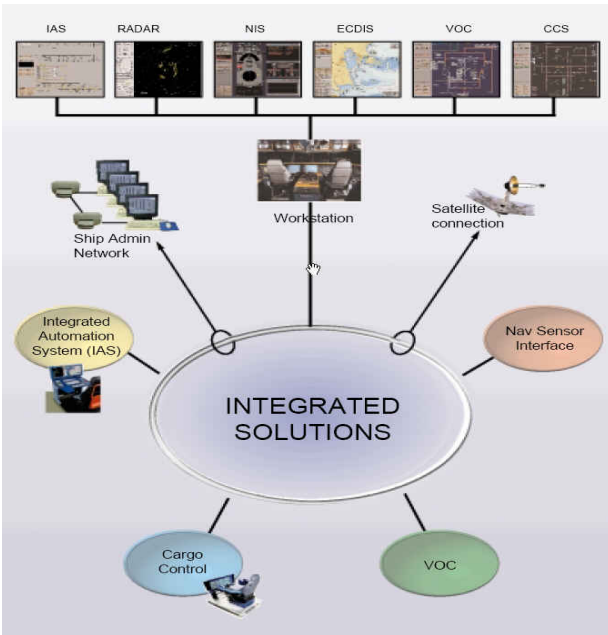

The general design philosophy for the equipment is based on safety of personnel, environment, simplicity, and efficient handling. In addition, the equipment shall give easy access for inspection, maintenance and replacement of parts, if required.

Rather than dictating functional possibilities, AC welcomes close interaction with the customer and operators of the system. This would involve introducing the customer to Innovations and may be done in a study phase prior to the design freeze.

INTEGRATED CONSEPT

All information in the IAS is distributed via computer networks to minimise cabling. The figure above shows an example of an integrated system. As indicated in the figure, the IAS can be seamlessly integrated with other ship systems, e.g. The Navigation Bridge systems.

The IAS is based on standard industrial off-the-shelf computer hardware and software from vendors with worldwide support. To optimise system maintenance and spare part logistics, the system components will be standardised to few variants.
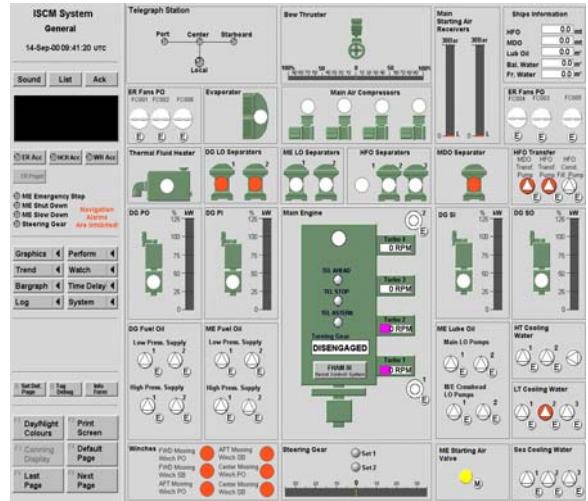
CLASS APPROVAL

Advanced Control delivers systems according to rules of the leading classification authorities, including:
- ➢ Det Norske Veritas
- ➢ Lloyds Register of Shipping
- ➢ American Bureau of Shipping
- ➢ Bureau Veritas

OPERATION PRINCIPLE

The system is designed to be as self-explanatory and easy to operate as possible for relevant personnel. All information is presented via graphical screens. The figure below shows an example of the screen layout. Pointing and clicking buttons and objects in the screen can reach all functions of the IAS-system. However, to speed up operation, some of the more important functions will also have shortcuts via a keyboard.

ALARM SYSTEM

All alarm events are detected, logged and presented throughout the IAS. In the engine room, additional notifications for some selected alarms may be given by dedicated light signals and sound.Alarm can also be notified through an external alarm system (e.g. Paging system, wireless telephone system alternatively separate distributed alarm panels.)
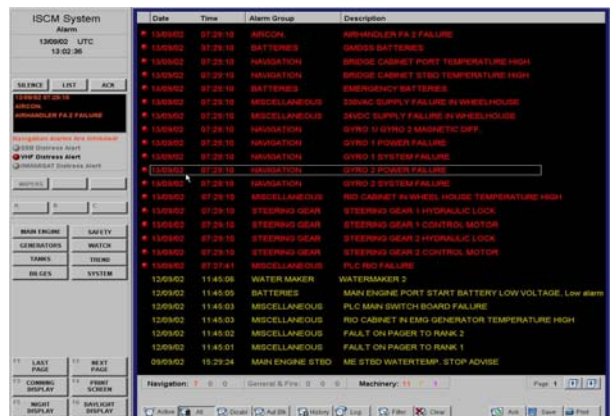
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DUTY / WATCH SYSTEM

A flexible duty/watch system can be integrated in the IAS. Dependant on the "on duty" selections, alarms will be notified on the relevant operator stations and individual units of the extended alarm system. If an alarm is not acknowledged within a given time, collective calls for the responsible alarm group are released on the external alarm system. Dead man functions for the engine room and the wheelhouse can be implemented as a part of the duty/watch system.
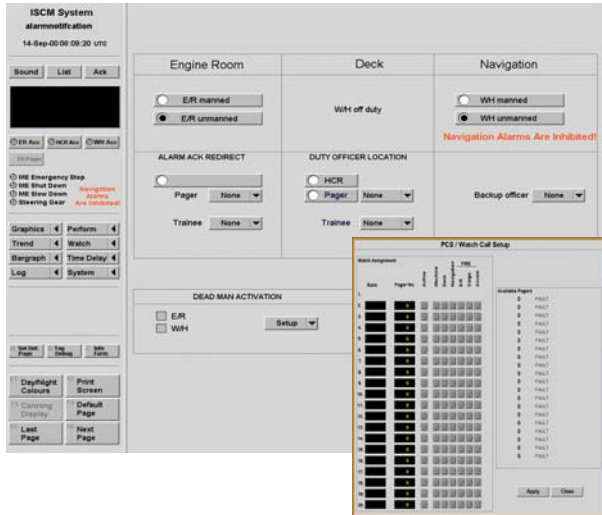

MAIN ENGINE CONTROL & MONITORING

All systems associated with the main engine can be controlled and monitored by the IAS. Instrumentation for fuel oil, thermal oil, lubrication, cooling, fans etc. can be connected directly to the IAS, while systems like e.g. Engine remote control can be interfaced via serial links or dedicated networks.
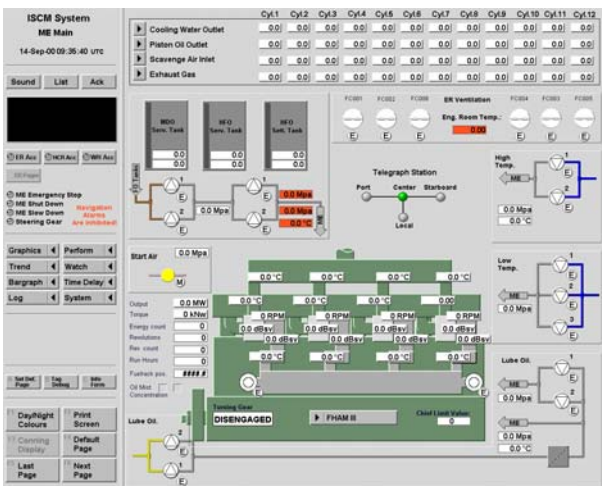

POWER MANAGEMENT

A distributed power management system can be integrated with the IAS. The power management system will handle functions like generator load sharing, automatic start-up of standby generators, successive start-up after a blackout, load shedding in critical situations etc.
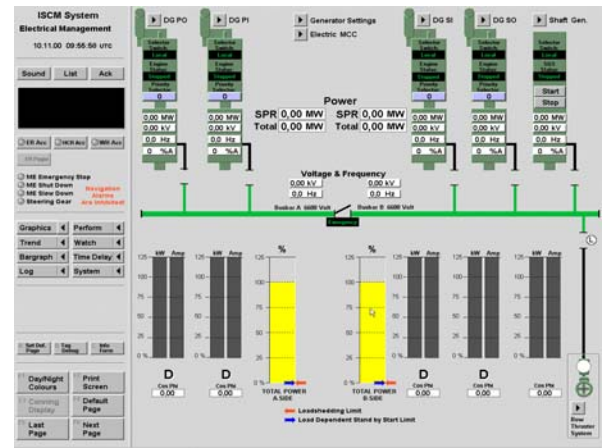
GENERATOR AND POWER DISTRIBUTION

All systems associated with the power generation and power distribution can be controlled and monitored by the IAS.
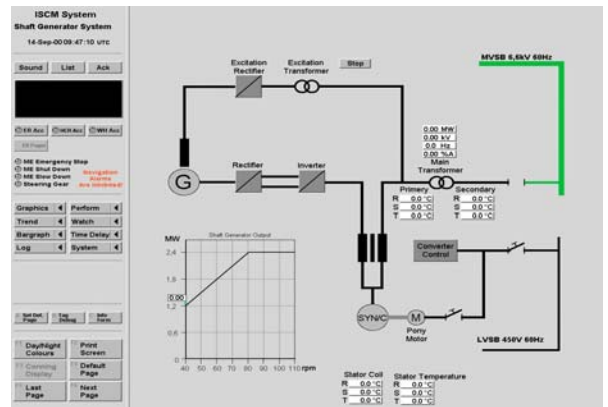
OTHER VESSEL SYSTEMS

All normal ship systems like e.g. Ballast, bilge, sludge, HVAC etc. can be integrated in the IAS. Separated stand-alone facilities, e.g. heeling system, fire detection systems, anti fouling systems etc. can be integrated via serial links or dedicated networks.