CORRESPONDENCE

MCR or Bridge Control

SIR,

With reference to the article in the *Journal* dated June 1986. 'MCR or Bridge Control', I feel that this is worthy of reply from a seagoer's point of view to illuminate some of the problems that may arise.

Having kept watches 'on the plates' and in an MCR the differences are readily apparent. When local watchkeeping in an engine/boiler room environment the 'hear, see, touch' rule is the guideline taught to fledgling watchkeepers. There exists only the necessary minimum of gauges and an EOOW has an 'on the scene' capability to avert any potential disaster. Once in an MCR the EOOW becomes more reliant on the myriad of gauges and warnings available to him. The EOOW is removed from the local situation and has to use the knowledge and experience of his watch to assess conditions in the machinery spaces and to supply him with accurate sitreps so that, when required, correct remedial action can be instigated.

With control of the propulsion plant moved to the bridge there will exist the necessity to give the bridge watchkeeper sufficient in-depth training to enable him to identify any machinery that is not operating within the correct parameters. Also, should breakdown occur, he must know what initial action to take. As far as reducing the time-lag between a failure happening and its rectification, this will work in some instances but the loss of a major system, for instance lub oil or CPP, will require a local assessment of the incident and may prolong the wait for sitreps—a condition less likely to come about with an MCR watch.

It is a requirement in warships to provide secondary control positions for main equipments. This would, of course, include the MCR. Although supposedly unmanned in State 3, would ships be tempted to close up a skeleton watch on a 'just in case' basis? Also, in the event of a failure, does the MCR crew take charge, once present, and return control to the bridge after fixing the fault, or merely act as advisors whilst remaining in bridge control?

Having spoken to various OOWs, most feel that the form of bridge control fitted is quite satisfactory. The back-up from the EOOW relieves the technical decision-making requirement from the already busy OOW, giving him freedom to concentrate on ship's safety in the event of serious machinery problems. The MCR can make immediate demands for Sea Emergency Parties and Emergency Manoeuvring Teams as and when required. This is especially so during the silent hours, where delays could be extremely dangerous.

How big would the bridge console need to be to monitor sufficient parameters? There is a premium of room on a bridge. Will warship bridges require to be redesigned or radically changed? There are many computers small enough to be fitted in ships, but to what level does the computer control start/stop and defect investigation? Although advances in microtechnology have been very rapid, the program required to monitor all of the possible combinations of machinery is enormous.

What type of discrepancies would the monitor consider adequate to abort a start? It would appear that, in this instance, the human factor cannot be satisfactorily replaced. The training required by bridge watchkeepers to man

such a system will be long, involved, and consequently costly. Once again, what depth of knowledge will be considered sufficient to qualify in bridge watchkeeping?

What form of back-up system will be fitted to cover a total loss of power to the controls, apart from an LP Battery with a limited time available for emergency supply? The MCR appears to be the obvious answer, but, again there crops up the question of time delay until the compartment is manned, not very desirable at night in a busy shipping area.

Assuming that there will be reduced manning in ME departments if propulsion control moves to the bridge, the increased hi-tech level of maintenance will tend to preclude the use of semi- or non-skilled labour to carry out periodic maintenance tasks. This could reduce still further the function of mechanics to that of painters and scrubbers, with consequent loss of morale and status. If there are fewer MEs on board to meet the departmental commitments, there may be a dangerous loss of efficiency in the day-to-day upkeep of machinery. This loss would also be reflected in the overall fighting and seagoing capability of the ship.

Periods alongside for ships are invariably busy. Any catching up on defects from seatime takes place at this time. The workload on the few remaining technical ratings could possibly become too great, resulting in larger shore support requirements.

With the increase in automation there will be a greater potential for minor problems to occur which will be of sufficient importance to require prompt correction. A total loss of, say, control by the bridge, with the MCR unmanned, could pose an enormous danger to the ship's safety until local watchkeepers close up.

The comparison between commercial vessels and the Royal Navy does not seem valid, as the Merchant Service has a comparatively much smaller complement of engineers, uses a different structure for watchkeeping, and has different tasking.

As far as training goes, the whole watchkeeping/breakdown idea is that the MEs have the final say in matters concerning running machinery. With control being in the bridge's hands does this decision come from the OOW/Command, ultimately a non-technical rank? Any change in the current routines would require radical changes in sea training programmes and involve re-writing the current BRs and guidelines which are used in training.

At present, ships with bridge/MCR control facilities have the benefit of on-the-scene diagnosticians to prevent failures and, where possible, minimize the damage/danger aspect should machinery breakdown occur. There is also the inherent 'gut-feeling' most experienced watchkeepers acquire as to the state of machinery in their charge which would tend to be lost as the ME department's commitment to the watchbill became more part-time.

The starting/stopping of main engines is in MCR control at the moment, and the machinery configuration can be rapidly changed to suit Command requirements. Only the time taken to pass orders causes any delay. Should a start/fail or an interlock discrepancy appear, it can be quickly investigated and corrected, for instance a fuel valve indication which may be only a sticky micro-switch. A bridge watchkeeper would not be able to make these checks as quickly as the MEs closed up in the MCR.

It is my feeling, therefore, that although this idea may be the answer to some problems, the final act of giving control of the propulsion plant to the bridge is still a long way off.

(*Sgd.*) D. A. Gardiner
CPOMEA, MCR Watchkeeper
H.M.S. Glasgow

The author of the article referred to responds as follows:

SIR,

I am grateful to CPOMEA Gardiner for taking the time to comment 'from the seagoer's point of view'. The comments that he makes are indeed very valid and must be taken into consideration if, and I stress if, the manned MCR is phased out. Clearly there are some differences of opinion, but at the end of the day I hope that the veto will lie with the seagoer, and not the pen-pusher.

I would like to deal with the letter sequentially, commenting as necessary.

Its third paragraph discusses two major aspects—training, and reaction times/delays.

(*a*) *Training.* I do not accept that moving the control of the propulsion plant to the bridge (or Ops room) will necessarily result in additional in-depth training for the new operator. Do not confuse 'Control' with 'Control Surveillance'. The type of consoles that we are all familiar with would not be used on the bridge. Indeed, if they were we might as well move the ME there! What I was alluding to was a console much like that on the RIVER Class minesweepers, where bridge control consisted of start/stop facilities and idiot lights. Monitoring and surveillance would be done by computer (and the ME department), not the bridge.

(*b*) *Reaction Times/Delays.* The type of problems described in the letter are subject to standard operating drills. Any drill can be computerized. It would be the computer that re-acts to the breakdown, not the bridge watchkeeper. I accept that the diagnosis of the fault may take longer, but we both know that the catastrophic failures you describe are often practised but thankfully seldom experienced. What I advocate is that the very expensive and valuable ME not spend his time watching gauges but instead get on with as much maintenance at sea as possible. Can this be construed as a return 'to the plates'?

The main problem with the *status quo* is that it simply costs too much. There is not a captain in the fleet who will not insist that the ME 'mans' the equipment. A skeleton crew is a possibility, but this ignores the fact that the crew is not there to do the job. The letter mentions 'act as advisors while remaining in Bridge control'. This usually involves setting machinery rate or power limits or setting other constraints on the operation of machinery, and is easier to do than may be thought: re-program the computer. Does this mean the bridge really has control? The ME remains in charge (so to speak) but without needing to expend manpower to do so.

'Having spoken to various [R.N.] OOWs . . .' The point I try to make in my article is that almost all merchant ships have bridge control. Surely if the sample were extended to include the masters of these ships you would get a different answer. The German Navy has bridge control in the BREMEN Class. Even the R.N. has it in R.N.R. vessels. I accept that there is a reluctance in some OOWs to take on additional tasks, but they already have the responsibility for the safety of the ship and therefore should be well versed in machinery details.

It comes as a surprise to me that in the R.N. the EOOW is the one who calls for Emergency Manoeuvring Teams. Other navies use different methods. For instance, the Canadian Navy makes this an OOW responsibility. Is not automation already used to make the system safer (in the form of, say, automatically starting the second steering motor)?

The console can be as small as a calculator, with the computers located off the bridge. A more reasonable size would be a TV screen (or equivalent),

say a 12 inch VCS unit. As for program size, we in the Navy may like to think of our propulsion plant as complex, but I have been reliably told that it really is quite trivial compared to a chemical processing plant, a nuclear power station, or even the Command and Control System which the WEs live (struggle?) with. The best analogue to the CVS, for instance, is a 4-engine turboprop aircraft, which certainly is a bridge controlled vehicle with a computer assisted Control and Surveillance System. To summarize, the programme is feasible.

I advocated in my article that the system be 'set up' by the ME. The sailing checks would enable or prevent computer starts. For instance, if the ME decided that the port Tyne was not usable, he would inhibit the computer from starting it. It is asked what depth of knowledge will be sufficient to qualify in bridge watchkeeping. I will simply say that there is very little additional knowledge required.

What is used now when there is a total loss of power? The control system can 'fail-set' on loss of power, or indeed 'fail-safe'. Any option can be chosen. I accept that speed of response may be improved with the man closed up, but if that was the whole criterion there would be no need for an MCR since speed of response is even faster if the man is on the plates.

Employment of the ME department at sea would consist of maintenance not operation. Even though this may improve the availability of the machinery, I agree that more shore support is likely to be necessary.

The letter says that 'With the increase in automation there will be a greater potential for minor problems to occur which will be of sufficient importance to require prompt correction . .' Yes, but how do all those thousands of merchantmen cope? The varied tasks that merchant vessels have must not be underestimated. Did the STUFT ships radically alter their organizations during CORPORATE?

Why is the Navy different to the Merchant Service in its manning? Is there a logical explanation for needing up to 100 men to run a naval propulsion plant when the merchantman has only a dozen (or less)? If the bills were paid out of our pockets, would we make improvements on the reliability of the machinery, especially the auxiliaries, and get rid of the men? Perhaps it is time to make the comparison between merchantmen and navies valid again.

I think that it is high time many of the current BRs are re-written in any case. But more to the point, I agree that there will be changes, but they must not be seen as an evil to be avoided. Perhaps the scope of responsibilities of the MEO and his department will change, but does this matter if the ships become more efficient and capable? There are many who argue that trade demarcations were the curse of dockyards and heavy industry. Surely they do not exist in the R.N.? Do they?

All the points towards the end of the letter are valid, but they assume that the Navy will be able to continue to man its ships in the same way in the future. Demographic trends indicate that recruiting men with sufficiently high technical aptitude will become much more difficult. The Navy will not have the manpower it has now to do the jobs at sea in the rather quaint, old-fashioned, manpower-intensive way it does now. There are hosts of reasons to not make the change to centralized control. The letter touched on many of them. But I want to point out that there are as many reaons to go for the low manpower option, not least of which is cost. Men are the most expensive element of the Navy. A ship which is properly designed to operate with fewer men will not necessarily be less capable, but, even if it does half the job with one third the manpower, it is *more efficient* and probably cheaper to operate.

The last paragraph says' . . the final act of giving control of the propulsion plant to the bridge is a long way off.' Two things I would add:

(*a*) The pressure is already on to reduce manpower, and one of the prime areas for reduction is in marine engineering; and

(*b*) Automation is coming. The MEs had better get prepared and take charge of it when it does come.

There is no reason to assume that the ships of the future need to be operated or controlled in the same way as they are now. The merchant marine has saved considerably by automation. This has not been without penalties, but the alternative was to drive cost through the roof and go bankrupt. In today's tough financial climate, the Navy is also in danger of going bankrupt. Automation may have its penalties, but the alternative of an even smaller navy is much less palatable, especially when cost-cutting measures might have avoided the reduction in the first place.

(*Sgd.*) K. A. Heemskerk
Lieutenant-Commander, Canadian Navy

H.M.S. 'SULTAN'

SIR,

An historic moment in Marine Engineering Artificer Training was reached on 12 December 1986 when the 36 members of 832 Class, the first batch of *Sultan* completely home-grown apprentices, passed proudly out of *Sultan* into the Fleet. The present course differs from the previous *Caledonia* Course by its reduction to eleven terms and the integration of the electrical content throughout the syllabus rather than as a separate module at the end. The last of the three terms of apprentices who joined *Sultan* from *Caledonia* in January 1986 also passed out before Christmas.

The spring term 1987 is the last term where apprentices, along with other career courses requiring practical electrical training, will have their electrical training conducted in *Collingwood*'s 'White City'. The new Electrical Training Group in *Sultan* is nearing completion of the fitting-out phase and from 5 May 1987 it will be ready for use, and PROCTIS and EBD as they affect *Sultan* will be complete.

But things do not stand still. In January 1987 changes were introduced to nuclear training courses for senior rates, and course content of artificer apprentices' and candidates' courses are under review. As a first step, it is likely that the period of Auxiliary Machinery Watchkeeping Certificate (AMC) training, currently being undertaken in the harbour training ships in the sixth term, will move to the end of the apprenticeship so that the lessons learned there can be quickly converted into practical experience during the first sea draft. Other thoughts will almost certainly lead to earlier streaming of submariners to complete different engineering technology modules in the latter stages of the apprenticeship compared with those headed for the surface fleet.

All in *Sultan* believe they are on track in producing the right calibre of artificer for the Navy of the 1990s, and await the reports of the Training Feedback Team on the first ex-*Sultan* apprentices with interest.

An update on the new training facilities now available in *Sultan* as a result of the current redevelopment programme will appear in the next issue of the *Journal*.

The Officers of H.M.S. 'Sultan'
Gosport

DISTILLING APPARATUS IN MALTA

SIR,

In the June 1986 issue of the *Journal* (pp. 639–640) a building at Tigne in Sliema, labelled 'Sea Water Distilling Apparatus 1881', was illustrated and an appeal made for information on its history and purpose.

In 1880 the population of Sliema was already 3700, and there was such a shortage of water that it had to be carried in wine barrels from Msida—a distance of two miles. There are no natural springs in Sliema.

In April 1881, the Council of Government—as the governing body of Malta was then known—voted a sum of £435 to relieve the acute problem by transferring to Sliema the water distilling machinery which was formerly in use at Cospicua, one of the three cities over the other side of Grand Harbour. This machinery had been brought to Malta in 1877 at a cost of £1200.

The condensers could produce 20 tons of potable water every 24 hours, and the running cost was estimated to be two shillings per hour. This was a temporary measure until mains water could be brought to Sliema.

It was originally planned to place the plant at the Strand (the ferry landing place then, where nowadays is the bus terminus), but after reconsideration it was decided to install the machinery further out towards the point, near the last public bath on the way to Fort Tigne, where the water was clearer, free from mud, and away from the sewers.

A building was erected to house the machinery and the inscription was carved in the Maltese limestone over the main doorway. The plant did not function for long because of its running costs and also because in 1882 the Government extended the water mains from Birkirkara to Sliema.

The building now houses a printing press.

References

1. Zammit, T.: *Tas-Sliema u San Giljan*; Valletta, Empire Press, 1930
2. Zammit, W.: *Tas-Sliema fl-imghoddi*; Malta, for the author, 1981
3. *Debates of the Council of Government of Malta*; sittings of 13 and 22 April 1881.

(*Sgd.*) Joseph Bonnici,
837/2 High Street,
Hamrun, Malta

A popular article by Guido Lanfranco, giving similar information, afterwards appeared in *The Times of Malta* for September 17, 1986. This prompted a letter to the same paper a few days later, putting forward a different explanation. The writer of the letter, reprinted below, does not cite the source of his information.

> Sir,—With all due respect to Mr. Guido Lanfranco (Sept. 17), I wish to point out that the Seawater Distilling Plant at Tigne Sea Front was not installed by the authorities in 1881 for the convenience of 'a rising population in Tas-Sliema'.
>
> The still standing relic with embossed lettering, showing construction in 1881, was built by army engineers for sufficient supply of water for the grooming of horses of the cavalry regiment stationed at Tigne barracks nearby, during the British military expedition to Egypt and the occupation of Cairo in September 1882.
>
> Yours truly,
> A. L. CARUANA
> Sliema.

At the request of the editor of the *Journal,* Mr Bonnici has responded as follows:

SIR,

I do not feel that the plant was primarily built for horses, for the following reasons:

(*a*) Money for the building of the plant was voted by the Civil Government. Normally anything connected with the military and for their use was paid for by them. In the debates the Royal Engineers were asked for the site by the Civil government; I do not suppose that any permission would have been needed if it was to have been built by the Royal Engineers.

(*b*) The proposal to build the plant was in April 1881, much before the Egyptian campaign.

(*c*) I am sure that availability of water would have been taken into consideration before 'posting' horses in the area. It would have been easier to put the horses where there were natural springs or water was easily obtainable.

(*d*) The local authorities took the trouble to engage two health experts to report on the suitability of distilled water for humans, and they arranged the siting of the plant so as to be free from pollution.

I have also contacted A. L. Caruana who said that about 25 years ago he was shown a report about the plant and the horses by some Army major, but when I pressed him to give me an idea of what it contained he conceded that it was only his impression that it was built primarily for the reasons he stated in his letter. After hearing my comments he could not exclude the possibility that the horses made use of the water available, but only incidentally, the main reason for the building of the plant being for the public use.

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