

EDUCATION, SCIENCE AND TRAINING

**SENATE LEGISLATION COMMITTEE – QUESTIONS ON NOTICE
2003-2004 BUDGET ESTIMATES HEARING**

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DEST Question No. E255_04

Senator Carr asked on 4 June 2003, EWRE Hansard page 330

Question:

Senator Carr : (Re Dr de Ronde's letter of complaint to Andrew Reeves)
... I would ask you to provide me with a detailed assessment of each of these complaints.
Obviously, I will give you the opportunity to refute the claims that have been made.

Dr Haymet : I am happy to do that now...

Senator Carr : I have a considerable amount of material here. I have no doubt that you can provide it to me in writing, unless you just want to give me a copy of your brief.

Answer:

CSIRO has provided the following response.

Southern Surveyor – complaints from Dr de Ronde

CSIRO responses inserted as italicised comments in letter below:

May 9, 2003
Andrew Reeves
Government official
Australian Federal government

RE: Comments on the Australian National Facility R/V *Southern Surveyor*

Dear Andrew,

In response to your phone call, I have compiled (and distilled) below some comments made by my colleagues and I regarding our impressions of the R/V *Southern Surveyor*. My colleagues include Gary Massoth (GNS), Ed Baker and Sharon Walker (both NOAA). Combined, we have probably over 85 years of experience in the general field of oceanography, ~3,500 days at sea on research vessels, have been chief or co-chief scientists of various expeditions on numerous occasions, authored or co-authored ~250 science publications, and so on. We have experienced working conditions on at least American (mostly), New Zealand, German, Japanese and Australian research vessels.

Our experience on Australian vessels comes from the April 2000 SHAARC cruise to PNG and the Solomons aboard the R/V *Franklin*, and more recently the March 2003 TELVE cruise to Tonga aboard the R/V *Southern Surveyor* with Dr. Richard Arculus of ANU as chief scientist. The comments outlined below only pertain to the R/V *Southern Surveyor*.

Some of Dr. De Ronde's comments below would also relate directly to Franklin. For example the size of labs (Franklin has less laboratory space than Southern Surveyor) and the number of scientist bunks available on Franklin is also 12. From a trace chemist's point of view, Franklin could also be regarded as a "dirty" ship, but Dr. De Ronde made no such comments after his Franklin voyage.

Firstly, we would like to recognize the crew of the R/V *Southern Surveyor* who were very knowledgeable, extremely helpful, and always willing to work on breakdowns when and wherever they occurred. At times it was a little confusing as to who was the appropriate person to approach for various matters, but we were impressed all around with the dedication and exceptional effort every person on board made to keep the ship running and meet scientific goals. Not only did everyone work very hard, they did so with positive attitudes and friendly dispositions. The people on board made the trip quite enjoyable and rewarding for all of us.

It's difficult to understand how a group with "over 85 years of experience in the general field of oceanography, ~3,500 days at sea on research vessels, have been chief or co-chief scientists of various expeditions on numerous occasions, authored or co-authored ~250 science publications, and so on" experienced confusion as to who was the appropriate person to approach. It was very clear who the Chief Scientist and the voyage manager were and that did not change during the voyage.

Secondly, we are very appreciative of the Australian government for providing funds to support oceanographic research that is not necessarily within Australian territorial waters. We think this is an insightful and progressive approach to doing science in what is becoming an increasingly smaller world. We are also grateful to our Australian science colleagues for inviting us to participate on these cruises and thereby enabling us to compliment our own science.

General comments relating to the ability of the R/V *Southern Surveyor* to perform adequately as a research vessel (in no particular order) include:

(1) The limited berthing capacity for scientists is about one-half that acceptable as a minimal standard. As it is, the *Southern Surveyor* is effectively disabling when it comes to our ability to conduct a full-on science program and provide little opportunity for multidisciplinary cruises or participation by studentshow will they train the next generation of researchers? Because science funding everywhere today forces interdisciplinary expeditions such as TELVE, we view the *Southern Surveyor* as inadequate when compared internationally as an ocean going research platform.

Southern Surveyor is limited to 12 scientific berths (or "passengers") by its classification. The possibility of adding scientific berths by changing the classification was thoroughly investigated by John Wallace (previous Ship Manager) before the conversion began. John found that the only way to change the class was to meet SOLAS 74, which required the installation of 2 watertight bulkheads across the ship, through all decks. This was deemed not to be practicable. A quick look at some Research Vessel brochures in the office shows that Franklin (55m) has 12 scientific berths, Scotia (69m) the recently built Scottish research vessel has 12 scientific berths and Pelagia (66m) the Dutch research vessel built in 1991 has 15 scientific berths. I would say that these ships were considered internationally to be "adequate ocean going research platforms".

(2) A multi-beam bathymetric mapping system should be added, as its absence compromises many modern research programs (we believe this is planned for the near future?). This would be an extremely valuable asset for any 'premiere' Australian research vessel to have.

Agreed and the proposal is progressing.

(3) We had multiple problems, hydraulic and electric, with the CTD winch and wire systems. It was impossible to know if these problems were just a 'shakedown' issue for new gear or if the system will not be capable of normal work loads without frequent breakdowns? For example, the CTD cable was not installed adequately for use by a project like ours (improper tension) which we believe lead to an avoidable injury to a crew member (see below). There were also problems with the CTD winch itself which cost the crew considerable time to make repairs at sea.

Although Dr. De Ronde states that it was impossible to know whether the problems experienced with the CTD winch will be recurring I explained to him during the voyage the causes of each of the problems encountered and our plans and schedule to rectify them (Don McKenzie, Voyage Manager SS02/2003).

Yes, there were shake-down problems which we have and are rectifying at first opportunity. Regarding the CTD winch, work is planned for the Darwin port period (22 June to 3 August) which is the first available opportunity because the Cairns port period was not long enough at 12 days for the scope of work.

(4) The lab spaces seemed relatively small compared to other ships of comparable size we have sailed on, but OK for our needs.

Unlikely to be true - they are huge compared with Tangaroa's (75m ship) chemistry and science labs and slightly larger than Franklin's (55m ship).

I note Dr. De Ronde does not appear to be sure about this. In any case, you can only get so much into every meter of ship space.

(5) The issue of inadequate time dedicated to a proper 'shakedown', or sea trial, prior to the *Southern Surveyor* beginning its new season of research work may ultimately have compromised safety on the ship. That is, the newly installed CTD cable (which we used constantly) had only been wound on the drum from the wharf. Normal operations would see the cable then deployed in deep water prior to any cruise, winding the cable back on the drum under appropriate tension, thereby preventing possible spooling problems later on.

The research voyage schedule had been set before the conversion began, with the expectation that approval would be given for the conversion much earlier than it eventually was. We delayed the sailing date for the first voyage a couple of times but eventually, we had to decide whether to proceed with the schedule or not as there was no room for further "squeezing" of the schedule. We carefully considered the operational requirements of each voyage and decided that the ship and systems were adequate to meet those requirements - and, to date, each voyage has successfully met, or exceeded, the scientific objectives. The planned sea trials were reduced to the minimum and jobs such as painting and final cleaning of some areas were postponed.

During winding of the CTD wire onto the winch before the sea trials the for'd CTD drum spooling gear sustained damage due to an equipment mishap which required the fabrication of a new Archimedes (spooling) screw. The screw could not be completed before the ship was scheduled to sail for the first voyage but as the CTD winch was not required on that voyage we decided to sail on schedule and to fly the repaired spooling gear to Auckland to be fitted between SS01 and SS02.

CTD wire re-spooling was actually scheduled for the Hobart sea-trials (the sea-trial voyage plans bear this out). After the spooling gear damage prior to the sea-trials, it was only possible to re-spool the aft CTD drum at sea and this was successfully done to 2000m. At that time we were satisfied that although not an ideal situation, we had a system that would meet the requirements of the forthcoming schedule until further work could take place during a scheduled port period. History has proved this correct, although some further work was required on the CTD spooling during V2 and V3. To provide some perspective, it took some years to work through the CTD wire spooling problems on Franklin and Aurora Australis when those systems were commissioned and this experience is not unique to Australian research vessels.

During the TELVE cruise we had some serious problems with the cable spooling inadequately on the drum which cost us many hours of delay due to maintenance (an unwanted experience at sea given the huge cost of the operations).

The Chief Scientist, Professor Arculus, in his Voyage Summary, reports the cumulative loss of about 12 hours during the 21 day voyage due to CTD winch problems, however, his report also states that the repair time was used productively to carry out other operations such as dredges or surveys.

This then led to a decision to try and spool the wire off while transiting and rewind back on the drum under tension. Consequently, the crew found themselves doing a task that should

have been done under more ideal conditions (i.e., stop the ship in deep water offshore Tasmania). In the end a crew member was seriously injured trying to do this operation. It is arguable that this injury (which could easily have been life threatening) was avoidable and can be tied to inadequate sea trials due to severe time constraints which in turn is related to inadequate funding.

With hindsight most accidents are avoidable and are usually the result of a series of unforeseen factors coming together. The facts are that the winch was not ready to use off Tasmania, the waters off Tasmania are not significantly deeper than the waters south of Tonga, neither of which is related to inadequate funding.

The injury Dr. De Ronde refers to was primarily the result of equipment moving quickly as a result of prevailing sea conditions, which is not an uncommon hazard on a working vessel at sea. Hazards of the operation had been discussed during a “toolbox” meeting prior to the event and the injury sustained was a cut under the eye, which we believe was caused when the crew member’s safety helmet was struck by a piece of equipment. Although a number of personnel were present, there is some conjecture about what actually happened. Needless to say, the task was aborted after this event.

(5) The most distressing aspect of the ship was its overall physical condition. It was in a state of obvious disrepair. A totally inadequate amount of time was allowed for general maintenance, repairs and upgrades prior to restoring this ship to service. It was the most grimy, filthy ship we have ever sailed on (in contrast to the New Zealand research vessel, R/V *Tangaroa*, which is by far the most spotless, at least with respect to the inside spaces). It will be an expensive exercise to get and keep a 30-yr-old ship modernized.

If this is the “most distressing” aspect of the ship then Dr. De Ronde’s other complaints can be seen in new perspective. Yes, we have a 30 year old ship and some of the décor internally is dated but functional. Commercial cleaners spent some time on the internal areas that had been soiled by conversion works and although this improved the internal appearance, there were some areas such as the floor covering in alleyways that did not clean up as well as we had hoped.

*Externally, although the contractors had applied primer to exposed metal surfaces, the ship was in need of some painting which would have dramatically improved the overall look of the working areas on deck. When I arrived to join *Southern Surveyor* in Brisbane, the crew had painted some of these areas with a noticeable improvement in appearance evident (Ron Plaschke, *Voyage Manager SS03/2003*).*

Specific comments relating to the ability of the R/V *Southern Surveyor* to perform adequately as a research vessel (in no particular order) include:

(1) In some instances the ability to secure sampling gear was *unsafe* in high-sea conditions. For example, deck tie-down fittings (a standard on most vessels today) are entirely missing and many wall attachment points used in place are makeshift, weak, and in the way to easy access for sampling.

There were over 70 deck tie-downs (24mm stainless steel sockets with grub screws) fitted to the working areas of the shelter deck and forecastle deck during the conversion. Dr de Ronde chose, against my advice, to sample his CTD rosette on the deck outside - rather than inside - the specially designed and refitted CTD wet lab. The wet lab is fitted with deck tie-down points specifically to safely secure a CTD for sampling. There was no mention of the

preference to sample the CTD outside on deck in the Voyage Plan or before sailing but we did our best to meet those requirements and to secure the CTD safely using lashing points available. These lashings did hinder access to certain bottles on the rosette (Don McKenzie).

We would be reluctant to fit any tie-downs outside the wet lab because it is unsafe in all but good weather conditions to work in this area to say nothing of being constantly covered in seawater. The wet lab is fitted with an excellent CTD trolley system which enables the CTD to be safely lifted and moved inside the wet lab. This trolley has been specifically designed in stainless steel and uses polyester rope so the system is suitable for trace chemical work such as that performed by Dr. De Ronde (Ron Plaschke, Ship Manager).

(2) For sampling trace constituents in seawater, an objective of many research programs today, the *Southern Surveyor* was simply unclean. Part of this was from the vessel not being truly ready for sea duty when we used her, but part is endemic to that ship may not be simply solved by time and clean rags alone. Crew smoking in science space (the only option other than not smoking) and hydraulic fluids and rust on many surfaces are a worry.

Once again, the CTD wet lab is a much cleaner, safer environment to sample for trace constituents than the deck area outside the CTD wet lab which is heavily trafficked, frequently used and is also just outside the mess and recreation room.

(3) Embarrassingly poor condition of living spaces.

During the conversion project the cabins were re-upholstered, re-carpeted and re-curtained and fitted with CD players. The recreation rooms and gym were refurbished and the galley and serving areas upgraded. These improvements have received favourable reactions from crew and research support groups. Other areas inside the ship are 30 years old (eg messroom) and the décor reflects this age.

The lounge adjacent to the messroom was refurbished with modern materials and the foc'sle deck lounge was furnished during CSIRO's initial conversion and is still a clean and modern in appearance.

The quality of the fresh water on board was shocking (can those tanks really be saved?).

For the first few days of the voyage the fresh water was (strongly) discoloured. This was due to a residue of sediment in the pipes and in the hot water system left over from the dirty tank problems of the previous voyage. The tanks were blasted, cleaned and refilled in Auckland before SS02 and, as the system flushed through, the water became clear. The tanks are scheduled to be blasted again and re-coated during the Darwin port period. The tanks are otherwise in good condition.

Some doors don't work, head spaces often a mess or crowded with other gear (plus paper towels in scarce supply!).

The doors have been repaired (in Cairns). Repairs had been carried out in Auckland and again in Brisbane but they were not completely successful, probably due to the fact that the locks are of European origin.

On Southern Surveyor it is the responsibility of each scientist to clean their cabin and bathroom, the marine crew cleans the "public" toilets. I was unaware of any problem with

the cleanliness of the toilets until reading this letter. Some cleaning gear (mops and buckets) is stored in those toilet areas.

The steward routinely replaces the paper towels, I was unaware of any problem with the supply of paper towels until reading this letter (Don McKenzie).

Mattresses and pillows should be replaced.

During the conversion the crew's mattresses were replaced - they had been used, on average, twice as much as the scientist mattresses. The mattresses and pillows in the scientist cabins were inspected at that time and deemed to be satisfactory. I will ask the Chief Steward to inspect them again and to make a recommendation (Don McKenzie).

(4) Embarrassingly poor condition of working spaces. Weather decks and railings were in a sorry state, rust everywhere and in some places covered with grease and oil so that they were *dangerously* slippery.

The internal working spaces had been cleaned before sailing and some had been upgraded during the conversion. I was not embarrassed by their condition. At the time of SS02 much of the deck area had still not been painted since the major works were completed and surface rust appeared very quickly. During SS02 the area was prepared with "rust converter" and painting was carried out on the transit from Nuku'alofa to Brisbane at the end of SS02. The appearance of those areas has improved dramatically since SS02.

During the voyage Sharon Walker reported that a handrail and stairway adjacent to where we had been working on the CTD spooling gear was greasy and slippery. That area was degreased and washed down the same day.

We thought deck spaces were also crowded and difficult to maneuver around, i.e., very awkward to move about the deck spaces say from fantail to bow. It seems like too much gear has been added to upper decks, far more than originally intended. We trust the stability has not been compromised? Door handles and railings throughout the ship were also extremely dirty and grease-covered. Some door handles did not work and doors sometimes stuck shut (*which could become a major safety issue if an emergency situation were to develop*). Water dripping from the overheads, especially in the computer ('ops') room, was an ongoing problem.

Much effort was expended during the conversion to "open up" the back deck to make the ship more suitable for multi-purpose marine research. The result was a major improvement in free deck space compared with the previous back-deck design, which was only well suited to trawling operations. The CTD deck area was not changed in the conversion, nor the access from stern to bow.

Gear has not been added to the upper decks, the opposite is true and the vessel now has more storage space on the foc'sle deck than pre-conversion. It would help if Dr. De Ronde could tell us what he thinks was originally intended?

Stability has not been compromised. This is a fundamental issue and CSIRO conducted a light ship and inclining experiment before the ship put to sea, not because we had to but as a double check that the Naval Architect stability calculations that were made during the conversion were correct.

The water dripping from the deckhead was identified as condensation from A/C ducting - some lagging had been removed during the conversion. The ducting will be re-lagged in Darwin.

Drain system in hydro lab permanently backed up.

I was not made aware of any blocked drains in the hydro(chemistry) lab during Dr. De Ronde's voyage - this would have been a serious issue and would have received immediate attention. There is no mention of it in the Chief Scientist's Voyage Summary or in the document listing "suggested improvements". There have been National Facility hydrochemists working in that lab on two voyages since SS02/2003 and they have not found any drains to be backed up. (Don McKenzie)

In the wet lab, there have been some issues with drains being blocked from time to time. The lab routinely has hundreds of litres of seawater dumped on the deck from niskin bottles during sampling and the drains there can back up. The engineers are working through the issues which are also related to the volume of water draining from the thermosalinograph overflow. This issue has not been top priority because the wet lab is a wet area by nature and any excess water flows away over the side.

Buckled flooring was also evident and should be inspected for underlying structural problems.

Some inside areas on the ship have "floating floors", marine ply over 200mm of M60 insulation. Over the years some of these area have "buckled" especially if the ply overlay has been wet at some stage.

The ultra-pure water system in the hydro lab was not operational.

The system was operational, however when I asked Dr Gary Massoth before the voyage if he wanted the system turned on he told me that he had brought all the milli-Q water with him that was required on the voyage and did not require the system to be turned on (Don McKenzie).

In any case, the Milli-Q water system was not requested in the Voyage Plan, which is the proper forum to request the various systems on the ship as an experienced marine researcher such as Dr. De Ronde should know. Dr Gary Massoth, who co-ordinated the equipment for the NZ contingent, had no such problems communicating his requirements with CSIRO.

(5) We thought the computer systems on board and the types of data acquired by the ship were adequate and comparable to other ships we have sailed on (i.e., navigation, weather, bottom profiling, ADCP and winch data). The computer network and potential for visiting scientists to connect to the network seemed impressive, though not entirely functional at the time of our cruise.

Considering the size of Australia's EEZ (2nd or 3rd largest in the world?) and presumably the importance the State attaches to that fact with its recently completed UNCLOS work, we are disappointed that the R/V *Southern Surveyor* is the best oceanographic research platform that Australia has to offer. On a scale of 1-10, compared to other ships we have sailed on, we would probably rank the *Southern Surveyor* about a 3, maybe 4. Given the size of Australia's population, the strength of its economy, and the ability of the nation to perform so well on a world scale to stage events like the Sydney Olympics, it is even more surprising how poor the

main research vessel is.

Dr. De Ronde's opinion.

These comments are intended to provide positive feedback in areas we believe significant improvements can be made to improve Australia's national research facility *Southern Surveyor* and we hope they will be seen in that light.

Had Dr. De Ronde taken the time to discuss these issues with the CSIRO Voyage Manager during his voyage, he may have been able to provide more informed opinion.

Sincerely yours,

Dr. Cornel E.J. de Ronde
Principal Scientist
Institute of Geological & Nuclear Sciences (NZ)