

Parliamentary Standing Committee on Public Works

SUPPLEMENTARY REPORT
relating to the
**PROVISION OF NAVIGATIONAL
AIDS, HYDROGRAPHERS
PASSAGE**
Great Barrier Reef

(Eleventh Report of 1984)

1 9 8 4

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

SUPPLEMENTARY REPORT
relating to the
PROVISION OF NAVIGATIONAL AIDS,
HYDROGRAPHERS PASSAGE

Great Barrier Reef

(Eleventh Report of 1984)

Australian Government Publishing Service
Canberra 1984

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS

(Twenty-Seventh Committee)

Senator Dominic John Foreman (Chairman)

The Honourable Wallace Clyde Fife, M.P. (Vice-Chairman)

Senate

House of Representatives

Senator Gerry Norman Jones	David Bruce Cowan, Esq., M.P.
Senator Bernard Francis Kilgariff	Peter Hertford Drummond, Esq., M.P. Leonard Joseph Keogh, Esq., M.P. Eamon John Lindsay, Esq., M.P. John Saunderson, Esq., M.P.

EXTRACT FROM

THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES
NO. 28 DATED 6 OCTOBER 1983

PUBLIC WORKS COMMITTEE - REFERENCE OF WORK - GREAT BARRIER REEF - NAVIGATIONAL AIDS: Mr Hurford (Minister for Housing and Construction), pursuant to notice, moved - That, in accordance with the provisions of the Public Works Committee Act 1969, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for consideration and report: Provision of navigational aids, Hydrographers Passage, Great Barrier Reef.

Mr Hurford presented plans in connection with the proposed work.

Debate ensued.

Question - put and passed.

© Commonwealth of Australia 1984

WITNESSES

Clague, I.M., Esq., Senior Engineer, Technical Division,
Premier's Department, P.O. Box 185, Brisbane North
Quay, Queensland

Cochrane, J., Esq., Chairman-Technical Committee, Australian
Chamber of Shipping, 60 Pitt Street, Sydney,
New South Wales

Eaton, D.R., Esq., Associate Director Projects, Department of
Housing and Construction, 145 Eagle Street,
Brisbane, Queensland

Eccles, P.B., Esq., First Assistant Secretary, Marine Operations
Division, Department of Transport, P.O. Box 594,
Civic Square, Australian Capital Territory

Emmery, M.K., Esq., Assistant Director, Economic Assessment
Branch, Bureau of Transport Economics,
P.O. Box 501, Civic Square, Australian Capital
Territory

Gilmour, Dr A.J., Executive Officer, Great Barrier Reef Marine
Park Authority, P.O. Box 1379, Townsville,
Queensland

Grant, Captain D.J., Navigation Spokesman, The Queensland Coast
and Torres Strait Pilot Service, G.P.O. Box 1573,
Sydney, New South Wales

Holden, Captain J.D.

(1) General Manager, Dalrymple Bay Coal Terminal
Pty Ltd, M.S. F283, Mackay, Queensland

(2) Invited Representative, Queensland Coal
Owners' Association, G.P.O. Box 908,
Brisbane, Queensland

Osborn, Captain RAN (Retd) J.H.S., Part-time Employee, Marine
Operations Division, Department of Transport,
P.O. Box 594, Civic Square, Australian Capital
Territory

Snelgrove, Captain J.R., Representative, The Queensland Coast
and Torres Strait Pilot Service, G.P.O. Box 1573,
Sydney, New South Wales

C O N T E N T S

Thompson, J.W., Esq., Project Engineer, Marine Operations
Division, Department of Transport, P.O. Box 594,
Civic Square, Australian Capital Territory

Toomey, J.J., Esq., Member, Queensland Coal Owners'
Association, G.P.O. Box 908, Brisbane, Queensland

Wilkinson, F.L., Esq., Assistant Secretary Maritime Works Branch,
Department of Housing and Construction,
470 Northbourne Avenue, Dickson, Australian Capital
Territory

Wohlfahrt, B.E., Esq., Project Manager, Department of Housing and
Construction, 145 Eagle Street, Brisbane,
Queensland

	<u>Paragraph</u>
THE INITIAL REFERENCE	1
COMMITTEE'S ELEVENTH REPORT OF 1983	4
THE COMMITTEE'S INVESTIGATION	6
PROVISION OF HELIPADS	
Maintenance Arrangements	8
Committee's Conclusion	11
Pilotage Arrangements	12
Committee's Conclusion	19
Viability of Pilotage Service	20
Committee's Conclusions	25
ENVIRONMENTAL PROTECTION	27
Environmental Protection Procedures	28
Cat Island, Tasmania	32
Departmental Advice on Procedures	38
Departmental Instructions	40
Summary	41
Committee's Conclusions	42
TIMING	45
Committee's Conclusions	49
RECOMMENDATIONS AND CONCLUSIONS	51
<u>APPENDIX A</u>	
Table 1 - Total Capital, Operating and Maintenance Costs	A-1

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

PROVISION OF NAVIGATIONAL AIDS, HYDROGRAPHERS PASSAGE,
GREAT BARRIER REEF

SUPPLEMENTARY REPORT

By resolution on 6 October 1983 the House of Representatives referred the proposal for the provision of navigational aids, Hydrographers Passage, Great Barrier Reef, to the Parliamentary Standing Committee on Public Works for investigation and report to Parliament.

The Committee has the honour of presenting the following supplementary report:

THE INITIAL REFERENCE

1. The proposal, when initially referred to the Committee, was for the provision of maritime navigational aids to mark a deep water channel through the Great Barrier Reef known as Hydrographers Passage. It will enable ships operating between central Queensland ports and the North Pacific and Asian regions to safely use the passage with resultant savings in shipping costs due to reduced steaming times.
2. The proposal will comprise four major lighthouse towers, each equipped with automatic lights, and a smaller structure surmounted by a radar reflector.
3. The estimated cost of the proposed work when referred to the Committee was \$4.7 million at September 1983 prices.

COMMITTEE'S ELEVENTH REPORT OF 1983

4. The Committee's Eleventh Report of 1983 (Parliamentary Paper No. 377/83) recommended the construction of the work in the initial reference. The Committee's recommendations also stated that a risk analysis should be undertaken, concurrent with the development of Hydrographers Passage, to assess the likely impact of long term shipping operations in the passage. In addition the Committee recommended that the Department of Transport pursue through the International Maritime Organisation, agreement to compulsory pilotage in Hydrographers Passage, with a system of exemptions, on examination, for suitably experienced masters.

5. Paragraphs 32 to 36 of the Committee's Initial Report, which are set below, indicate the Committee's intention to submit a supplementary report.

"32. Supplementary Report The Department of Housing and Construction intends calling tenders for the work in January 1984, to enable scheduling of construction activities in accordance with likely favourable periods in the weather. To enable the Departments to meet this self-imposed deadline, the Committee had no alternative but to complete its report within two weeks of the public hearing. Unreasonable demands have been placed on the Committee in this regard, and it is therefore critical of the Department for not referring the proposal to the Committee at a much earlier date. In this instance insufficient recognition has been given to the role of the Committee in the planning process for the proposed work.

33. In making a special effort to complete this report before the end of the 1983 parliamentary sittings, the Committee was not able to fully consider certain matters due to insufficient evidence.

34. When further information is received, the Committee intends preparing a supplementary report which will deal with maintenance arrangements for the proposed navigational aids. Specifically the Committee is seeking further evidence on cost comparisons of servicing the aids by ship or by helicopter. This has implications with regard to the need for helipads at each of the proposed sites.

35. The Committee is also awaiting further information, that the Department of Transport has undertaken to provide, about environmental protection measures that are adhered to by maintenance personnel. During the site inspection the Committee was concerned to find that old batteries from the automatic weather station had been discarded on Creal Reef. This conflicts with assurances that wastes were always removed by maintenance personnel, who generally have a high regard for the environment of the reef.

36. The supplementary report will be available early in 1984."

THE COMMITTEE'S INVESTIGATION

6. Subsequent to the public hearing the Department of Transport and the Great Barrier Reef Marine Park Authority provided further information on a number of matters related to the proposed work, in response to specific requests by members of the Committee. The Committee resolved that this information be included in the Minutes of Evidence.

7. The Committee agreed that a further public hearing would not be necessary.

PROVISION OF HELIPADS

8. Maintenance Arrangements At an early stage in planning of the project the Department of Transport gave consideration as to whether or not helicopter landing pads should be provided to assist maintenance arrangements. Construction of helipads adjacent to each of the four main lights was estimated to add about \$2.5 million to the capital cost of the project.

9. Before deciding not to construct helipads the Bureau of Transport Economics evaluated the capital, operating and maintenance costs of the navigational aids using three alternative forms of transport, discounted over the nominated forty year life of the structures. These costs are shown in Table 1 at Appendix A.

10. The table shows that over forty years, the lower maintenance costs using helicopters will not completely compensate for the higher capital cost of the structures if helicopter landing pads are included. The Department of Transport therefore considers that the additional capital cost for helipads is not justified.

11. Committee's Conclusion The Committee accepts that the additional capital cost of helipads, to assist maintenance arrangements, is not justified.

12. Pilotage Arrangements In its submission the Queensland Coast and Torres Strait Pilot Service suggested that an efficient pilotage service can be provided (without helipads) using either of the following alternatives:

- Combined launch/amphibian operation: a launch is placed on permanent station in a sheltered lagoon near the boarding ground. Pilots and relief launch crews are ferried between the mainland and this lagoon by amphibious aircraft.
- Helicopter Operation: Helicopters, based on the mainland, transport pilots direct to ships at the boarding grounds, the actual transfer taking place by either a "land on deck" or "winch down" method.

13. Whichever method of pilot transfer is eventually determined to be the most viable, establishment and capital costs will be high. In the case of helicopter operation, a high performance helicopter would be required, capable of a 230 nautical mile non-stop round trip from Mackay to the boarding grounds and return (2 1/2 hours). The cost of a permanently manned amphibian/launch operation would also be very high. Based on the estimated costs, the Pilot Service gave a preliminary estimate of the pilotage fee at \$5,000 per transit.

14. The Pilot Service also stated that the provision of a suitable helipad in close proximity to the boarding grounds would reduce its initial capital expenditure on aircraft by as much as 50 per cent, with consequent flow on benefits to users of the

service. Such a platform would also reduce operating and maintenance costs because an aircraft can be retained in the area to attend to two or more ships needing pilot transfers in short succession - rather than returning to Mackay after each operation. The Pilot Service therefore recommended to the Committee that a suitable platform should be included in the design of the navigational aid structure on White Tip Reef.

15. The Committee was initially of the view that if a dual purpose could be served by helipads - maintenance and pilots - the additional capital cost may be justifiable. However further evidence suggests that the Pilots require a platform of much higher standard than needed by the Department of Transport for maintenance.

16. The basic requirements for a helipad for the pilotage service would be: capacity for 24-hour operation, storage and equipment for defuelling and refuelling, undercover protection for one aircraft, a landing area large enough to accommodate two aircraft at once, stop-over facilities for five persons, and maybe the installation of an air navigation beacon. The capital cost of such a facility is estimated to be \$2-3 million.

17. The Department of Transport stated that a single platform, of any standard, was of little value for maintenance of its navigational aids, as it would only service one light and arrangements would still have to be made for the other three lights.

18. In view of this the Committee now recognises that the provision of helipads for maintenance and the provision of a helipad to assist pilotage, are completely separate issues.

19. Committee's Conclusion The provision of helipads for maintenance of the navigational aids, and the provision of a helipad to assist the pilotage service, are completely separate issues.

20. Viability of Pilotage Service The Queensland Coast and Torres Strait Pilot Service stated that neither it, nor any other private organisation, could meet the high capital cost required to establish the pilotage service (with or without helipads) without compulsory pilotage. Compulsory pilotage would give the service an assured level of patronage.

21. The Pilots in their submission, were therefore seeking either one of the following:

- Compulsory Pilotage - to give an assured level of patronage to the Pilot Service to safeguard the high level of capital investment it would have to make to establish the service; or
- Government underwriting of standing charges on infrastructure and equipment - to enable a pilotage service of questionable viability to be maintained (without compulsory pilotage).

22. In its Initial Report the Committee recommended that the Department of Transport pursue agreement to compulsory pilotage, with a system of exemptions, on examination, for suitably experienced masters. As well as improving safety in Hydrographers Passage, the implementation of this scheme would undoubtedly contribute to the economic viability of the pilotage service.

23. In these circumstances the Pilot's submission suggests that a viable service can be provided, even without the provision of a helipad. The Committee believes that the service should initially be established in this way.

24. Notwithstanding this, the Committee recognises that a much more efficient service could be mounted if a helipad was available near the boarding grounds. However, it is not appropriate for the Committee to become involved in the question of Commonwealth assistance in the provision of a helipad that would mainly serve to improve the economics of an already viable business.

25. Committee's Conclusions Pilotage services in Hydrographers Passage should initially be established without a helicopter landing platform.

26. Any request for Government assistance in the provision of a helipad should be treated on its merits, and not linked to the maintenance needs of the navigational aids.

ENVIRONMENTAL PROTECTION

27. In its Initial Report on this reference the Committee made the following comment:

"During the site inspection the Committee was concerned to find that old batteries from the automatic weather station had been discarded on Creal Reef. This conflicts with assurances that wastes were always removed by maintenance personnel, who generally have a high regard for the reef."

28. Environmental Protection Procedures When the Committee presented its Initial Report it was still awaiting a response to its request for a copy of written instructions to maintenance personnel relating to environmental protection measures. Hence the need to address this issue in a Supplementary Report.

29. On 30 December 1983, the Department of Transport responded to the Committee's request in the following terms:

- No specific written instructions have been issued to field maintenance staff on general environmental protection measures. However, the Departments' Regional Engineers are responsible for ensuring that maintenance staff under their control take appropriate steps to protect the environment at navigational aid locations.
- Limited written instructions have been issued relating to the disposal of primary cells. (Copies of current instructions - TR 6.1000 dated February 1978, and TR 6.1003 dated September 1981, were provided to the Committee.)
- Current disposal practice varies from area to area throughout Australia. In some areas the cells are returned for incineration. In some areas cells are returned in industrial waste bags and buried at an approved site. In some areas discharged battery residual and electrolyte have been drained into rock crevices so that minimal environmental damage will occur and the casing buried locally.
- Steps have now been taken to update current work practice. It is proposed that in the future, primary cells be recovered for destruction by incineration or burial at an approved waste disposal facility. (A copy of

the Department's draft Standard Practice Code 6.1000, dated December 1983, was provided to the Committee.)

- The Department is carrying out a program of converting primary cell lightstations to either solar or wind power. This is because of problems of battery disposal, and the less than satisfactory performance achieved from primary cell batteries.

30. The abovementioned letter from the Department of Transport indicated that at the time of the public hearing there were no uniform instructions from Central Office on the disposal of batteries, and that in some circumstances practices that led to pollution of the environment were condoned.

31. The letter also indicated that new instructions had been prepared that will prohibit dumping and disposal of wastes on site (draft Standard Practice Code 6.1000 - December 1983). However, these new instructions were somewhat belated, and there may not have been any change at all, had the Committee not enquired into this matter.

32. Cat Island, Tasmania More recently the Committee has become aware, through press reports, of a fire on Cat Island, in Bass Strait, that apparently started when some batteries were burnt to dispose of them.

33. It was reported in the Hobart Mercury (8 February 1984) that on 8 January 1984 the fire quickly swept across the 30 ha island, a proclaimed wildlife sanctuary. About 50,000 adult mutton birds and fairy penguins and 50,000 of their chicks and eggs, and six adult Australian gannets and all their chicks and eggs were reported to have been destroyed. The gannetry was one of only six in Australia and had been the subject of an intensive

program by the National Parks and Wildlife Service to try to increase the population of 20 breeding birds. It was claimed that decades of careful protection and breeding have been lost.

34. The Committee was concerned that such a fire could occur, particularly given the assurances of improved disposal practices circulated as draft Standard Practice Code 6.1000 - December 1983, for comment by all Regions only days or weeks prior to the fire.

35. The Committee sought further details of the nature and cause of the fire from the Department, and in response it was advised that expended primary cells were burnt on the Island on 7 January 1984 under instructions current at that time. These were the instructions which provided that the disposal method to be adopted was to be at the discretion of the Senior Regional Engineer.

36. The Department further stated that detailed investigations had indicated that the battery burning site was "adequately" extinguished by the Departmental work party on 7 January, but that the subsequent fire could have been caused "by ignition from smouldering vegetation near the battery burning site".

37. The draft Standard Practice Code 6.1000 of December 1983, which requires the return and disposal of batteries at an approved waste disposal facility, was not then in force. At that stage it had only been referred to Regions for comment.

38. Departmental Advice on Procedures In its letter of 30 December 1983 the Department of Transport failed to make it clear to the Committee that draft Standard Practice Code 6.1000 was not yet in force. In fact the Committee believes that the intent of the letter was to impress the Committee with the Department's apparent speedy response in rectifying identified

problems, and to leave the impression that new procedures had been put into effect. It was only in defence of its position after the Cat Island fire that the Department admitted that the new environmental requirements were not introduced until February 1984. The Committee would have assumed that the Regions would have taken note of the provisions of the draft Code, and implemented them in the interim period.

39. The Committee notes that the information provided in the letter of 30 December 1983 was technically correct, however it is critical of the Department for framing it in a manner that was misleading to the Committee.

40. Departmental Instructions Many of the Department's lightstations throughout Australia are located in environmentally sensitive areas, e.g. the Great Barrier Reef, and Cat Island - to name but two. In these circumstances the Committee believes it would be prudent to add to the relevant Departmental instructions, the requirement that Regional staff consult with Commonwealth and State environment and land management agencies on maintenance procedures. These agencies should be made aware of activities that will be undertaken at lightstation sites, and conversely they could provide information on periods when maintenance is likely to cause minimum disturbance to the natural environment (if any). Maintenance activities should then be programmed accordingly.

41. Summary The Department of Transport has recently upgraded its environmental protection measures, particularly with regard to the disposal of primary cell batteries. However, it is up to the Department's Regional Engineers and maintenance personnel to ensure that they are adhered to. The Cat Island fire is a clear example of the potentially disastrous consequences that can occur, if correct measures are not taken to protect the environment.

42. Committee's Conclusions The Department of Transport should impress upon its Regional Engineers and maintenance personnel the need to strictly adhere to environmental protection procedures - particularly with the disposal of primary cell batteries.

43. Pollution of the environment should be viewed seriously, and the Department should ensure that it has adequate disciplinary powers that will be implemented in the event of breaches of procedures.

44. Departmental instructions should include a requirement for Regional staff to consult with relevant Commonwealth and State environment and land management agencies on maintenance procedures.

TIMING

45. As indicated in paragraph 5 of this report, the Committee was required to complete its Initial Report within two weeks of the public hearing, so that the Department of Housing and Construction could meet a self-imposed deadline for calling tenders for the project. The Department stated that tenders had to be called in January 1984 to enable scheduling of construction activities in accordance with likely favourable periods in the weather.

46. The Committee has now observed in the Commonwealth of Australia Gazette No. G16, that tenders for construction of the navigational aids were actually called on 24 April 1984.

47. This is some three months later than the deadline that the Committee was led to believe was critical. The Committee therefore believes it is entitled to be advised as to:

- why tenders were not called in January 1984, as planned;

- whether there has been any effect on the plan to schedule construction activities in accordance with likely favourable periods in the weather;
- whether there has been any change to the proposed completion dates (November 1984 for daytime navigation and April 1985 for night-time navigation);
- whether there has been any effect on the limit of cost estimate for the project; and
- any other effect that the delay has had on the project.

48. The need to quickly prepare its Initial Report meant that the Committee was unable to address all of the issues relating to Hydrographers Passage before tabling. However, the deferred calling of tenders now indicates that time would have been available for a complete investigation in the first instance, and it would not have been necessary for the Committee to include this Supplementary Report in its busy program of activities.

49. Committee's Conclusions The delay in calling tenders for this project indicates that the circumstances of urgency under which the Committee prepared its Initial Report were not as genuine as it was led to believe by the Department of Housing and Construction.

50. The Committee requests that the Minister for Housing and Construction explain the circumstances and the consequences of the delay in calling tenders for the work.

RECOMMENDATIONS AND CONCLUSIONS


51. The recommendations and conclusions of the Committee and the paragraph in the report to which each refers, are set out below:

		<u>Paragraph</u>
1.	THE COMMITTEE ACCEPTS THAT THE ADDITIONAL CAPITAL COST OF HELIPADS, TO ASSIST MAINTENANCE ARRANGEMENTS, IS NOT JUSTIFIED.	11
2.	THE PROVISION OF HELIPADS FOR MAINTENANCE OF THE NAVIGATIONAL AIDS, AND THE PROVISION OF A HELIPAD TO ASSIST THE PILOTAGE SERVICE, ARE COMPLETELY SEPARATE ISSUES.	19
3.	PILOTAGE SERVICES IN HYDROGRAPHERS PASSAGE SHOULD INITIALLY BE ESTABLISHED WITHOUT A HELICOPTER LANDING PLATFORM.	25
4.	ANY REQUEST FOR GOVERNMENT ASSISTANCE IN THE PROVISION OF A HELIPAD SHOULD BE TREATED ON ITS MERITS, AND NOT LINKED TO THE MAINTENANCE NEEDS OF THE NAVIGATIONAL AIDS.	26
5.	THE DEPARTMENT OF TRANSPORT SHOULD IMPRESS UPON ITS REGIONAL ENGINEERS AND MAINTENANCE PERSONNEL THE NEED TO STRICTLY ADHERE TO ENVIRONMENTAL PROTECTION PROCEDURES - PARTICULARLY WITH THE DISPOSAL OF PRIMARY CELL BATTERIES.	42

TABLE 1

TOTAL CAPITAL, OPERATING & MAINTENANCE COSTS

	Paragraph
6.	POLLUTION OF THE ENVIRONMENT SHOULD BE VIEWED SERIOUSLY, AND THE DEPARTMENT SHOULD ENSURE THAT IT HAS ADEQUATE DISCIPLINARY POWERS THAT WILL BE IMPLEMENTED IN THE EVENT OF BREACHES OF PROCEDURES.
	43
7.	DEPARTMENTAL INSTRUCTIONS SHOULD INCLUDE A REQUIREMENT FOR REGIONAL STAFF TO CONSULT WITH RELEVANT COMMONWEALTH AND STATE ENVIRONMENT AND LAND MANAGEMENT AGENCIES ON MAINTENANCE PROCEDURES.
	44
8.	THE DELAY IN CALLING TENDERS FOR THIS PROJECT INDICATES THAT THE CIRCUMSTANCES OF URGENCY UNDER WHICH THE COMMITTEE PREPARED ITS INITIAL REPORT WERE NOT AS GENUINE AS IT WAS LED TO BELIEVE BY THE DEPARTMENT OF HOUSING AND CONSTRUCTION.
	49
9.	THE COMMITTEE REQUESTS THAT THE MINISTER FOR HOUSING AND CONSTRUCTION EXPLAIN THE CIRCUMSTANCES AND THE CONSEQUENCES OF THE DELAY IN CALLING TENDERS FOR THE WORK.
	50


 (D.J. FOREMAN)
 Chairman

Parliamentary Standing Committee
 on Public Works
 Parliament House
 CANBERRA A.C.T. 2600

3 May 1984

	(A)	(B)	(C)
	Without	Helipads	With Helipads
Transp. for Major Insp.	Cape Ship	Cape Ship	Cape Ship
Transp. for Int. & Fault Trips	Cape Ship Charter Vessel*	Charter Vessel 'Lumen' or Amphibian Aircraft	Helicopter
CAPITAL COSTS	(\$'000)	(\$'000)	(\$'000)
Towers	4750	4750	7250
Navigational Aid Equipment	750	750	750
	5500	5500	8000
ANNUAL OPERATING & MAINTENANCE COSTS			
For 4 Routine Visits	266.1	141.0	115.3
Two Unschedule Fault Maintenance Visits	27.0	27.0	8.0
Total Operating & Maintenance Costs Per Annum	293.1	168.0	123.3
	(A)	(B)	(C)
TOTAL COSTS OVER 40 YEAR (DISCOUNTED TO PRESENT DAY VALUES)	(\$ million)	(\$ million)	(\$ million)
Discount Rate 7%	10.184	8.382	10.239
Discount Rate 10%	8.966	7.615	9.632
Discount Rate 13%	8.143	6.667	9.217

* For two unscheduled fault trips.