

## **CONTRACT HYDROGRAPHIC SURVEYS**

by Rear Admiral D.W. HASLAM, CB, OBE, FRICS(\*)

---

*This paper was presented at the "HYDRO'84" Conference, sponsored by the Hydrographic Society and the National Ocean Service/NOAA, which was held in Rockville, Md, USA, in April 1984. It is published in the Proceedings of the Conference and is reproduced here with the kind permission of the organizers.*

### **ABSTRACT**

National hydrographers — with responsibility for surveying to the accuracy needed for navigational safety — have been under pressure to keep pace with the rapidly increased draught of tankers, operating along new routes to new ports and offshore terminals, and accepting reduced underkeel clearances, at a time when offshore hydrocarbon and other new marine resource activities have called for extensive data collection, interpretation and presentation of quite different sets of parameters. The paper describes how contract surveys have been used to increase the surveying carried out for the safety of navigation in British waters.

### **GENERAL BACKGROUND**

1. Whilst less than a third of the world's maritime countries as yet have a national hydrographic surveying capability, several recent developments have highlighted the importance for all of them of providing for their coastal waters reliable modern survey data and of maintaining readily-available and updated navigational charts and publications. Some of these developments have also called for a spectrum of knowledge and experience which hitherto was not required, either by what might be called the "traditional hydrographic surveyor" — whose remit was almost entirely to collect data to ensure the navigational safety of mariners — or by the "traditional cartographer" — whose role was to simplify the available data so that the published navigational chart showed the bare essentials for safe navigation but left space on which the chart user could plot his track.

(\*) Flat 3, 151 Gloucester Road, South Kensington, London SW7 4TH, England.

2. In this connection, the recent technological developments which have enabled the exploitation of hydrocarbons from increasingly deeper and more exposed waters have called for specialists who are not only used to working under the peculiar conditions experienced at sea and to maintaining accurate records of their position (the “traditional hydrographer”) but who are also capable of interpreting geophysical and geological data, carrying out very detailed large-scale civil engineering-type surveys at considerable distances offshore and playing a vital role, in conjunction with civil engineers, in the positioning of very large offshore structures or laying long lengths of pipes and, subsequently, monitoring both platforms and pipelines for any degradation of their condition.

3. Whilst this new breed of “offshore surveyor” has acquired skills which the “traditional surveyor” did not originally possess (although many have acquired the new skills), the “offshore surveyor” does not necessarily have the experience needed in surveying very large areas for safety of navigation purposes, where every previously reported or suspected danger and every newly discovered danger must be meticulously investigated and either disproved or very accurately heightened. This may involve the use of techniques such as wire-drag sweeping and a greater knowledge of tidal theory than is needed by the “offshore surveyor”.

4. Another development which is likely to broaden still further the depth of knowledge required of a hydrographic surveyor is the provision in the 1982 UN Law of the Sea Convention which bases the outer, seaward, limits of the Continental Shelf not on a simple, easily defined, isobath (or depth contour) but on an interpretation of the angle of slope at the base of the continental slope and the thickness of the sedimentation. The application of this provision will require not only a skill not previously held by many “traditional surveyors”, but the collection of much new data.

5. Similarly, the possible exploitation and the subsequent management of marine resources within exclusive economic zones produces a need for thematic or bathymetric maps of these offshore areas containing all — rather than a skilled selection of — available data. Also, the increasing use of computers and automated systems for navigation is already creating a need for the provision of the basic bathymetric data in digital format in addition to the analogue or traditional chart format.

6. This paper attempts to cover only the role of contract hydrographic surveying companies in respect of data gathering for the ultimate production of the traditional navigation chart and associated publications, but all the above factors have at least some bearing on the selection and supervision of such companies for such surveys.

## THE UK BACKGROUND

7. Although the Royal Naval Hydrographic Service was formed originally to provide charts adequate for the requirements of British warships, these charts and

their associated publications have been made generally available to all mariners since 1823. Until the mid 1960's there was little need either to differentiate between the requirements of HM Ships and those of merchant ships or to survey considerable areas of the UK coastal waters, since these were known to be sufficiently deep for the passage of either class of vessel owing to the safe passage through them, for many years, of vessels which, despite becoming gradually longer and faster, retained much the same draught since the start of the 20th century.

8. During the 1960's, four developments began to change the British requirements — as for those of all other countries. One such development was the one already referred to — the sudden demand for suitable specialists to assist in the exploitation of hydrocarbons from the North Sea and elsewhere. At the time, there were no British academic institutions offering courses in hydrographic surveying apart from the RN Hydrographic School, Plymouth. The only available hydrographers were the uniformed RN officers and surveying recorders who undertook all the survey duties in the entirely naval manned HM Surveying Flotilla. Despite a significantly increased recruitment — particularly of officers on short service engagement for 5 or 10 years — the RN was hard-pressed to man the Surveying Flotilla which was at the time being enhanced to meet a second development : nuclear submarines.

9. These were designed to operate at greater depths than, and in different areas from, those previously used and they required data of no value to the other traditional users of the Hydrographer's products — the merchant seamen. But the third development — the closure of the Suez Canal in 1956 — had caused tankers on passage between the Persian Gulf and the developed western world to use the much longer route south of the Cape of Good Hope. Faced with this significantly increased cost and freed of the restriction on the size of vessel imposed by the transit of the Suez Canal, ship owners and ship builders rapidly increased the size — and axiomatically the draught — of tankers. VLCCs with draughts of over 70 feet, or double that of WWII tankers, became common and they began to operate along new routes, between new ports and loading terminals, hitherto never used by ships of any size. Economic pressures following the OPEC price rises in the mid-1970's caused shipowners to accept underkeel clearances of less than 10 % of the draught of a VLCC. In other words, hydrographers were expected to locate, height and chart all objects standing more than about 6 feet above the general seabed depths.

10. The Hydrographic Department at Taunton has details in its Wreck Data Bank of over 23,000 wrecks in or near to its coastal waters. Over 18,000 of these must remain charted as "Position approximate" and an example exists of one being identified by divers over 60 miles from where it had sunk less than 12 months previously — but only after another ship had collided with this peripatetic wreck.

11. The fourth development was caused by the world recession and the rate of economic inflation in the western world during the early 1970's. The requirement to provide extra data for defence purposes, whilst simultaneously providing extra data for the deeper draught VLCCs, took place at a time when pressures on the budgets of all government departments were increasing. It made little sense to our

Ministry of Defence staff to have to reduce the fighting elements at sea without seeing at least a similar reduction in the Surveying Flotilla.

12. There is an additional British factor which must be explained. All maritime States have a national responsibility for the safety of navigation of shipping in their waters. In UK, the department with this responsibility was the Marine Division of the Department of Trade which was, in 1983, transferred to our Department of Transport. This division had, and still has, responsibility for the safety of navigation in UK waters, the inspection of ships and the working conditions of British seamen. But, as has been explained, the Hydrographer of the Navy, funded entirely from Defence budgets, had responsibility for undertaking the surveys of British waters on behalf of both warships and all other users.

13. After considerable discussions, it was decided that, from 1982/83 to 1984/85 — and it should be noted that the Ministry of Defence's fiscal year runs from 1 April each year — the costs of surveys of primary civil interest would be met by contributions from the Ministry of Defence (MOD) and the Department of Trade (now of Transport) but that, from April 1985, budget responsibility for civil hydrography would pass from the Ministry of Defence to the Department of Transport, together with a transfer of budgetary provision equivalent to the MOD's existing contribution. It was emphasized that the Hydrographer of the Navy would continue to exercise professional supervision over the civil survey programme.

14. It should also be noted that, at the end of December 1981, only some 14,445 sq. m., or about 8.4 % of the UK's coastal waters, had been fully surveyed to modern standards — including a side scan sonar search and with all wrecks fully investigated — and there were some 116,150 sq.m., or about 67.3 % of our coastal waters which had either never been surveyed at all or had been surveyed only by hand lead-line many years ago.

15. In order to establish an order of priority of areas to be surveyed with the available resources, two committees were formed. The first included the two Ministries involved, Defence and Trade/Transport, as well as the Lighthouse Authorities, the General Council of British Shipping, the British Ports Association and a representative of the recreational users. Having decided which were the most urgently needed areas, a second governmental-only committee of the two Ministries decides how to programme the work to match the available resources each year. The committees meet in October and November respectively.

16. For 1982, it had been planned that the three small naval inshore survey craft would maintain their traditional role of monitoring the changes in depths in the southern North Sea where the seabed is very unstable — especially after the annual winter gales and heavy seas — and where there are several areas in which the depths are critical even to conventional draught vessels — including warships. In addition, a naval coastal survey vessel would have spent some time on what are regarded as essentially the civil priority tasks and an ocean survey ship — HMS *Hydra* — would have been used on the civil task area to the west of Scotland.

## THE START OF BRITISH CONTRACT HYDROGRAPHIC SURVEYING

17. HMS *Hydra* had returned to her base port, Plymouth, on 4 March 1982 after undertaking joint US/UK surveys off the Turks and Caicos and Virgin Islands in the West Indies. In April, her crew were recalled from leave and the ship was rapidly converted to an ambulance ship role in the South Atlantic, where she remained until returning to Plymouth on 24 September.

18. As soon as it was clear that *Hydra* would not be available, it was decided to place her intended package of work out to contract by suitable commercial hydrographic surveying companies. In order to make use of the best available weather-window — which in the area concerned runs from early April to about October — it was vital to get the work in hand without delay.

19. There were problems both for the government officials placing the contracts and for the commercial firms bidding for the work. On the one hand, although the Hydrographic Department (HD) had years of experience in issuing hydrographic instructions to the charge surveyors in command of HM Surveying Ships, detailed specifications, suitable for contract action, for such large areas had never been written before and — even more difficult — there was little knowledge of the capabilities of all the available companies to undertake the traditional surveys for navigational purposes. As has been described in the General Background, recent developments had resulted in a considerable widening of the skills of general hydrographic surveyors and it was regarded as very important that money and effort should not be wasted by either side of the contract due to any misunderstanding of the requirement.

20. As far as the commercial firms invited to tender were concerned, they too were forced to use a certain amount of guesswork since many of them, whilst vastly experienced in “offshore” surveying, had much less experience of the sort of surveys involved in this short-notice invitation.

21. In the event, the package was split into five areas; three to the west of the Outer Hebrides, which were the most exposed, were let to Gardline Surveys Ltd; when this had been let and a better idea obtained of the amount of money remaining for the more sheltered work inside The Minches, these last two areas were let to Hunting Surveys Ltd and Cosag Survey Ltd. It is MOD policy to treat prices as commercial-in-confidence, but the areas allocated to the three firms were 790, 210 and 206 sq.miles respectively. All were at 1:25,000 scale and to be fully swept by side scan sonar.

22. To ensure that the work was carried out most efficiently, the specifications required the employment of “suitably qualified hydrographic surveyors”, i.e. those known to the HD to have had recent experience of such large “charting” surveys. In addition, a senior naval charge surveyor acted as an overseer of the work of all three companies which, as all three were based in Stornoway in the Outer Hebrides, whilst difficult, was not impossible.

23. All the work was completed by the end of the year and the resultant "Fair Sheets" or "Smooth Sheets" were rendered on time. As ex-RN surveying officers and recorders were involved in all cases, the rendered data bore a remarkable similarity to that rendered by HM Surveying Ships, although several automated techniques adopted previously by the contractors were used with the agreement of the Overseer.

24. In 1983, it was possible to spend longer in preparing the specifications and the first contract — of some 1,113 sq. miles, north of the Outer Hebrides — was let to Gardline Surveys Ltd in April; using three vessels, Gardline completed their field-work by the end of August 1983 and rendered their data early in 1984. Land & Marine Engineering Ltd were not awarded the second contract — of some 970 sq. miles in the sheltered North Minches — until early in June, were not able to deploy any ships to the area until mid-July and ran into deteriorating weather conditions from late September onwards so that, despite using four vessels, they were not able to complete their area in the stipulated time scale. Although Racal Survey Ltd were not awarded the third and largest area (originally some 1,468 sq. miles) along the exposed north coast of Scotland until early July, they soon had three vessels on site and later added a fourth as well as two smaller craft to work close inshore; they also encountered severe weather conditions and had some other problems, with the result that, although the area was reduced considerably by a variation of contract, even their smaller area had not been finished in the agreed time scale. Arrangements have been agreed under which it is hoped that both survey areas will be completed by the end of the financial year. All were again at 1:25,000 scale with full side scan sonar coverage.

25. For 1984, it is planned to place further contracts, but in this year the priority tasks include an area in the English Channel — which is used for the lightening of deep draught VLCCs before they transit (or because they cannot transit) the shallow Dover Straits — as well as completing the route along the north coast of Scotland and eastwards through the Pentland Firth. If money is available, further work is planned to extend the tanker route surveys west of the Outer Hebrides southwards towards the refineries in southern Scotland and Wales. The task of overseeing these widely dispersed areas will be even more difficult.

26. Although not strictly contracted work, it should also be noted that, as another recent British variation in surveying for navigational safety, a civilian manned vessel — the forty-four-year old former Northern Lighthouse Board tender *Hesperus*, which had been bought and converted as MV *Sperus* for surveying work by Cosag Survey Ltd — was chartered by MOD for six and a half months from mid-April 1983 and with a small naval surveying team on board was used to undertake surveys of areas identified as priority civil tasks to the west of the Shetland Islands. With four naval surveying officers and seven surveying recorders working the same routine as the civilian crew but with no normal ship's duties, *Sperus* was able to work almost continuously — returning for a working day's replenishment and necessary changes of civilian and naval personnel every fortnight — and also to render the data to Office very shortly after completing the fieldwork.

27. As a result of this significantly increased effort to add to the normal output of the Navy's Surveying Flotilla, some 22,976 sq. miles (13.3 %) of British waters have now been fully surveyed to modern standards leaving some 112,176 sq. miles (65 %) to be completed. This is rather misleading since quite a large area of unstable seabed must be continuously monitored, but the improvement since December 1981 — paragraph 14 — is very encouraging.

### **BRITISH CONTRACTUAL PHILOSOPHY AND EXECUTION**

28. The survey specifications have been written in such a way as to avoid specifying particular fixing aids or other equipment that has to be used. The Schedule of Requirements attached to the Invitation to Tender merely specifies the area to be surveyed, the scale, the accuracies to be achieved, the time scale for completion of the fieldwork and rendering of data and the various requirements to be met from the Navy's "General Instructions to Hydrographic Surveyors". By not being specific, the potential contractor is given a degree of flexibility on the type of equipment and techniques he proposes to use; the resultant proposals assist the HD to assess whether a particular company has fully appreciated the problems.

29. When evaluating proposals, the following points are considered :

- (a) Whether the magnitude and complexity of the task have been fully appreciated;
- (b) Whether the equipment proposed meets the standards of accuracies required;
- (c) Whether sufficient expertise exists within the company (or will be hired by them) to complete the surveys to the specifications;
- (d) That the proposed method of execution of the work is acceptable — especially if different from traditional MOD methods;
- (e) That the resources and financial support within the company are sufficient.

30. Perhaps the point which has provided the most discussion is (c). Specifying that companies should have sufficient personnel with adequate experience — both in charge of, and assisting with, surveys for charting purposes — implied an element of judgement by the Hydrographer of the Navy. There was no problem over those senior naval surveyors who had recently retired from our Naval or Commonwealth Hydrographic Services; but what of those who had retired long before modern equipment was available, those who had retired as comparatively junior survey officers or surveying recorders but who had acquired "charting" survey experience in the private sector or large harbour authority, or those land surveyors, graduates from other disciplines and merchant service officers who had moved into the private sector to fill the demand described in the General Background earlier in the paper? Were they not perhaps as well qualified?

31. The situation was affected by the formation of a loose association of experienced charting surveyors which procured the services of surveyors from as far afield as Singapore, Australia, Antigua and Ireland and plans to offer a comprehensive consultancy package to governments, commerce and port authorities worldwide. There are now plans to form at least one other group of consultants in UK.

32. It was found that several of the 1983 tenders included the same names of those "acceptable" personnel and all but one of the consultants employed were provided by the association mentioned. There is, however, an increasing reluctance by the competing companies to have to hire consultants and, having been forced to do so, to heed their advice. This is due to "in-house" belief that the advice is not required or is too expensive and to a few personality clashes between the hired consultants and the company's management or party chiefs — many of whom have extensive experience and qualifications other than those of the British professional body of surveying — the Royal Institution of Chartered Surveyors.

33. This aspect is now covered by the following note attached as paragraph 4 in the Special Notices and Instructions to the Invitation to Tender — "Over the last two seasons, experience has shown that commercial surveying companies do not fully appreciate the additional complexities imposed by the area and time scale of the contract surveys when considering the planning and execution of the task. Tenderers are strongly advised to retain the services of personnel with experience in the execution of hydrographic surveys for nautical charting and to furnish the necessary details in their proposed plan."

34. It has been suggested that the employment and payment of consultants by the contractor on behalf of the client (MOD) is an unusual practice. It may be argued that this use of consultants is for the benefit of the contractors by advising them on the interpretation of the specifications and the relevant naval publications and interpretations of GIHS, etc. It could, however, equally be argued that such advice is available from the MOD's Overseer.

35. Although the method used has both advantages and disadvantages to both sides, it has worked reasonably well over the last two years; this does not mean that it will always continue to be used or is applicable in all countries. What is essential is that the client — the national government with responsibility for providing accurate data for the safety of navigation in its national waters — must have an ability to ensure the accuracy and completeness of the data regardless of how or by whom this is collected and rendered.

## FINANCIAL ASPECTS AND TIMING

36. In 1984, sixteen companies were asked if they were interested in receiving tender invitations; replies were received by 20 January and all sixteen applicant companies attended the pre-tender briefing on 10 February when invitations to



tender were issued. These were received back by 1 March and the contract award meeting was due to be held on 22 March with a view to placing the contracts by 30 March.

37. For each of the three years, the Government's preferred requirement for a fixed price contract has been possible to arrange. In preparing tendered prices, the contractors have to make contingency provision for weather conditions, the numbers of new wrecks found, breakdowns, etc., without over-pricing in a competitive situation.

38. A drawback of a fixed price contract is the possible temptation to cut corners, should the contractor's profit margin begin to disappear. Hence the need for a very tight specification and overseeing. A potential problem — both for the contractors and the Ministry of Defence/Department of Transport — could be a requirement on the Directorate of Contracts to accept the lowest tender meeting all requirements, unless strong and cost effective grounds can be shown for doing otherwise. Hydrographer's staff have recommended what appeared to be the most cost effective proposal in each case and, in practice, the lowest price has not always been accepted. As more commercial companies are awarded contracts, experience will be gained by both the government clients and the private companies.

39. Conditions as to price and progress payments are given in Annex A. As will be seen there, a down payment of 10 % is payable following mobilisation; five progress payments — totalling 40 % — can be made on certification by the Overseer and another 30 % of the total price is paid as the fair data is received by the Hydrographer. The final 20 % is not paid until all the fair data has been checked and any deficiencies made good in the field-work or in the fair drawing, etc.

### LESSONS LEARNED

40. As a result of experience gained since 1982, the following lessons have been learned :

- (a) The national hydrographic authority must retain a sufficiently large capability inter alia to undertake surveys for navigational safety in order to provide the expertise to specify and monitor the work of contract surveyors.
- (b) The specifications should allow flexibility on equipment and techniques to be used.
- (c) Contracting companies must employ personnel who understand the full implications of surveying to the high standards required for navigational safety.
- (d) There is a general shortage of suitably qualified personnel, ships and equipment.

- (e) The lowest tender is often submitted by contractors who have insufficiently qualified staff who have failed to appreciate that there can be no short-cuts where the end product can affect the safety of shipping.
- (f) There is a wide range of expertise available over the various sub-specialisations of hydrographic surveying.
- (g) There is a growing number of British survey companies with a flexible management approach and sufficient suitably qualified staff to undertake surveys for navigational safety to supplement the work of the national authority.
- (h) Although no contract work has been given outside British waters, the problems faced by contractors are probably greater than those by naval manned surveying ships with their much larger logistic and governmental support. Were the contract to be direct with an overseas government, both government and contract surveys would be on a more equal basis.

## ANNEX A

### CONDITIONS OF CONTRACT FOR HYDROGRAPHIC SURVEY

#### 1. General Conditions

The following Standard Conditions of Government Contracts for Stores Purchases (Form GC/Stores/1, Edition April 1979) :

Part I — Nos 1, 3, 8-11, 13, 15-18, 20 and 21

Part II — No 29 — Law (English)

— No 30 — Arbitration (English Law)

— No 31 — Use of Documents, Information, etc.

— No 32a — Patents, etc.

#### 2. Price

The prices payable under the Contract shall be as shown in the Schedule. The prices shall not be affected by delays or slippages caused by bad weather or other circumstances outside the Contractor's control unless attributable to changes in the specified requirements.

#### 3. Performance

Work under the Contract shall be in accordance with the specified requirements and to the satisfaction of the Authority as represented by MOD(N). Areas shall be surveyed and completed in the order of priority stated in the specifications. *Completed fair survey records for all of the area(s) specified in the Schedule shall be*

*delivered to MOD(N) by 1st December 1984. Field-work shall accordingly be programmed for completion before the onset of adverse winter weather conditions restricts operations. The Contractor shall, if necessary, use additional resources at no extra cost to the Authority to ensure that work is completed by the specified date.*

#### **4. Copyright**

Copyright in survey reports and all other data furnished by the Contractor under the Contract shall vest in the Crown. The Contractor shall not sell, hire or otherwise dispose of copies of the survey reports or other data furnished under the Contract to any third party, or make use of the results of the survey for his own or others' purposes without the prior written consent of the Authority in respect of such sale, etc., or use.

#### **5. Surveying Equipment and Personnel**

Vessels, equipment and personnel nominated by the Contractor for the survey work shall not be changed or substituted without the prior agreement of the MOD(N) Liaison Officer. Vessels, equipment, personnel and crews provided by the Contractor for work on the contract shall be the Contractor's responsibility at all times and the said vessels, equipment, personnel and crews and any loss, injury or damage suffered or caused by them shall be at the Contractor's risk throughout.

#### **6. Termination**

In addition to the Authority's rights of termination under other conditions, the Contract may be terminated by the Authority at any time subject to one month's notice in writing to the Contractor. Where appropriate the Authority may require the Contractor to furnish a report covering work done and data obtained to the date of termination, with such recommendations as may be possible at that stage. Such termination shall be without prejudice to the rights of the parties accrued to the date of termination, but shall be without further liability to either party.

#### **7. Default**

Should there be any failure on the part of the Contractor to meet the Contract requirements, the Authority may, without prejudice to rights under other conditions of contract, determine the Contract summarily and make alternative arrangements for completion of the work and recover from the Contractor any additional cost involved.

## 8. Payment

*a)* Progress payments may be claimed as follows once the survey work has commenced, provided the Liaison Officer is satisfied with the results and progress achieved :

(1) Payment following mobilisation .....	10 %
(2) Five equal monthly payments authorized as a result of field progress .....	40 %
(3) Payments authorized in relation to the rendering of fair records to Hydrographic Office (see <i>b.</i> below) .....	30 %
(4) Final payment which will be authorized once the whole survey has been accepted by the Ministry .....	20 %

*b)* To implement 8.a)(3) tenderers are required to sub-divide the total areas into schemes of fair sounding sheets. Payment under 8.a)(3) would be made on acceptance of completed sheets forwarded to the Hydrographic Office subject to authorization by the Liaison Officer.

*c)* Any progress payment under the Contract will be made at the sole discretion of the Authority and, if the Authority considers that the Contractor has failed to perform any of his obligations under the Contract he may, wholly or in part, withhold progress payments or recover from the Contractor any progress payment (including the addition in respect of VAT) already made, or both. The making of any progress payment shall in no way reduce the liability of the Contractor to carry out his obligations under the Contract.

*d)* If at any time by reason of progress payments made, overpayment to the Contractor results from the operation of other Contract conditions or from any other cause whatsoever, the amount of such overpayment shall be taken into account in assessing any further payments or shall be recoverable from the Contractor.

## 9. FINANCE RESOURCES

This Invitation to Tender is issued on the understanding that, before an order is placed, the Tenderer will first have to satisfy the Ministry that he has the resources to finance the cash flow to complete the Contract to the value of his tender and to meet all his obligations in connection therewith. You are, therefore, requested to forward with your tender a certified balance sheet and profit and loss account for the financial year ending not earlier than one year from the date of your tender. (This will not be necessary if the information was supplied with your recent questionnaire.) You are also requested to confirm your willingness to discuss, if necessary, your current financial situation with Ministry Accountants. Your tender should be on the understanding that you would be required to obtain

a suitable guarantee in relation to the performance and discharge of all your obligations under any Contract resulting from this invitation. This guarantee would only be required if it was intended to accept your tender.

NOTE 1. In the above conditions : (1) "The Authority" is the Secretary of State for Defence. (2) Reference to "Article" or "Articles" means the service to be provided, work to be performed and data or reports furnished, as appropriate.