CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

RESTRICTED

EXEMPLAIRE N° 224
COPY

ORIGINAL: ENGLISH/FRENCH
19th July, 1967

NATO ~~CONFIDENTIAL~~
DOCUMENT
DPC/D(67)97

N.A.T.O. RESTRICTED

INFRASTRUCTURE COMMITTEE

THE NATO-WIDE COMMUNICATIONS SYSTEM

Report by the Working Group of National Communications Experts

At the Defence Planning Committee's meeting on 7th June, 1967 (DPC/R(67)14, Item I), that Committee agreed to the immediate implementation of the NATO-wide communications system as described in DPC/D(67)6 and DPC/D(67)21, and invited the NATO Military Authorities to submit estimates of capital investment costs to the Infrastructure Committee. The Defence Planning Committee also noted that SHAPE had been directed to assume responsibility for the technical, engineering, scheduling, procurement and circuit leasing for the implementation of the system.

2. SHAPE accordingly requested that, in accordance with usual practice, the Working Group of National Communications Experts consider the proposed system, on the assumption that the necessary Infrastructure funds would be included in the Slice XVIII Programme. The Working Group conducted its studies at its meeting on 21st to 23rd June, 1967 and submits the following report for the guidance of the Infrastructure Committee. Owing to the short time available for the Experts to study the system, the recommendations given below are subject to confirmation by the Belgian(1), Danish and Italian Experts.

3. The SHAPE project management group presented to the Working Group a Type "B" estimate which is the result of the latest investigation on possible sources of equipment supply. The estimate includes the complete equipment set-up at the two switching centres (part of it on a rental basis) and at the tributary sites. It also includes site preparation and provision

(1) The Belgian Expert has later submitted a message explaining his point of view on one of the items requested by SHAPE - the radio relay system between SHAPE and Evere (mentioned in paragraph 4(i) below). His message is reproduced at Annex B.

of no break power as required. It does not cover, however, important works and essential elements of the project which are, or will be, covered under other relevant NATO projects. The most important of these is the TROL equipment, the cost of which, based on the agreed number of 84 Duplex terminals, on the unit price so far used for programming purposes and on the usual amount of contingencies and spares would amount to approximately £650,000. The other major work not covered in the estimate is the civil construction work for the switching centre at Evère.

4. The main points which were discussed and the changes to the Command's proposal which were agreed by the Working Group are as follows:

(a) the implementation and putting into operation of the system is closely related to the availability of TROL equipment. It has in fact been stressed by members of the Group that the system without TROL would have no meaning, its reliability and efficiency being dependent on the availability of appropriate crypto equipment. In this context the Group recalled the NATO Commanders' firm view that the use of existing crypto equipment was not operationally acceptable.

As far as renting modern equipment from NATO governmental sources is concerned, even if the appropriate quantities of equipment could be made available, there appear to be difficulties, pending the outcome of the selection procedure now in the hands of the Defence Planning Committee;

(b) the Working Group recommended that rather than introduce the multiple address processing unit (MAPU) in two phases as suggested by SHAPE's Group, the final semi-automatic system should be introduced at the outset thereby providing a reduction in the requirement for teleprinter switching equipment. The Working Group considered that the gain in time resulting from SHAPE's original proposal to instal a manual MAPU whilst the semi-automatic unit was being procured, would be slight (four months) and that in any case the absence of approved TROL equipment would mean that the manual unit could not be operated as SHAPE had envisaged. The Group would not recommend in fact to implement the system if TROL was not available. Should TROL equipment become available before the semi-automatic MAPU was procured, the system could, nevertheless, be operated by using the telegraph switchboards for circuit switching;

(c) the Group recommended that teleprinter equipment be reduced to exclude requirements for HICOM circuits which are not part of the NATO-wide communications system. This resulted in a reduction in the receive printing reperforators at the Evère switching centre from 30 to 26, and of the monitor printing reperforators from 30 to 24;

(d) with regard to the screen room for the Red Area at Evère, the Working Group noted that the communications building presently under construction had originally been designed especially to avoid the introduction of steel in the construction. Later it had become apparent that the floor would not be strong enough to support the equipment to be installed and steel reinforcements had therefore been added, thereby infringing the safety distances for the operation of the electronic equipment to be installed. The Working Group understood that SECAN and SHAPE were considering whether a screen room was necessary or whether a waiver of the security requirements could be granted. Accordingly, it recommended that the screen room should not be constructed unless no waiver could be granted;

(e) the United Kingdom Expert did not consider that a telegraph switchboard for circuit switching was necessary. However, he could agree to its introduction since the equipment was not proposed for purchase but for rental and only the installation costs were chargeable to Infrastructure funds.

The United States Expert said that he was able to support the rental of the telegraph switchboard as this was specifically agreed by the Defence Planning Committee for testing and evaluation purposes;

(f) the Working Group noted that the International Staff would investigate the question of whether power distribution switches and voltage regulators at the United Kingdom switching centre should be considered as part of the United Kingdom's responsibilities under the local utilities rule. It also noted that the no-break power equipment at the same centre would be of 25 KVA capacity;

(g) the equipment recommended for the national tributaries and MNCs terminals included a maximum of: four page printers; two tape receivers; two auto-transmitters and one tape preparation position. The overall cost estimate for national tributaries was amended from £28,130 to £40,000, giving a total for this part of the system (national tributaries plus MNCs) of £50,000, including contingencies;

(h) the total requirement for TROL equipment was reduced from 89 Duplex positions to 84, of which four were not recommended by the United States Expert, who considered that existing equipment could be used. The changes recommended by the Group included:

- the deletion of two Duplex positions for the tele-conference facility (to be replaced by secure cable);

- the elimination of technical stand-by equipment for the tributaries for the reason that two terminations were available for each tributary, although the basic requirement was that one circuit should be available at all times for consultation purposes;

- the addition of two Duplex positions at the new United Kingdom switching centre for circuits to the NATO Military Committee, and two positions at the NATO Military Committee for circuits to the United Kingdom switching centre (then four positions subject to United States reservation);

(i) the introduction of a radio relay between Evère and Casteau was supported as an extension to ACE HIGH, on the assumption that it would be used, as far as possible, to route through the system one of the two circuits to each of the different national tributaries and MNCs. The SHAPE Representative has accepted to investigate with the appropriate branch of SHAPE the possibility of using ACE HIGH for these purposes, even in advance of the completion of the ACE HIGH expansion project. The Group noted that SHAPE would co-ordinate with the Belgian Authorities regarding the introduction of the radio relay system in particular with regard to the frequency range to be employed;

(j) the Working Group recommended the deletion of the RTT access facilities as a part of this project; this might be integrated into the access into the RTT network at Evère;

(k) the Working Group noted that the Type "B" estimate included annual recurring costs in an amount of £17,933, but excluded the rentals for long-line circuits which had been estimated in Appendix 7 to Annex to DPC/D(67)6 to come to £312,121 per annum. The Working Group recommended to SHAPE that it inform the Military Budget Committee of the estimated rental costs as soon as possible, taking account of the savings that would result from routing circuits through ACE HIGH;

(l) on the state of advancement of the project, SHAPE stated that for what concerns the tributary stations, it had requested national authorities to review their cost estimates and nominate project officers to supervise its implementation. In messages Parmi 2004 and SH 21142 of 3rd and 9th June, 1967, SHAPE had given host nations guidance on the security requirements for the national tributaries and requested further information on any construction works involved.

5. The Type "B" estimate, revised in the light of the above recommendations, is summarised in the attached Annex. It will be noted that it includes the management costs for the system, which were submitted to the Working Group, but on which it made no recommendations.

(Signed) G. CIONI
Chairman, Working Group of National
Communications Experts

OTAN/NATO,
Paris, (16e).

PART I

EVERE SWITCHING CENTER

		Sub-total £	TOTAL COST £
A.	SWITCHING EQUIPMENT, semi-automatic MAPU type		
1.	Rack-Equipment	21,000	
2.	Power Supply Equipment	3,500	
3.	Operating Equipment	14,500	
4.	Teleprinter Equipment		
	(a) 26 Receive Printing reperforators		
	(b) 12 Send Tape Readers		
	(c) 24 Monitor Printing reperforators		
	(d) 2 Supervisory and re-run positions	30,000	
	(e) Spares (5%)	5,600	
	(f) Maintenance Equipment	700	
	(g) Installation Material	3,000	
	(h) Installation Cost	10,000	
	TOTAL COST SWITCHING EQUIPMENT		£86,300
B.	CONFERENCE EQUIPMENT		
	20 Line Conference and Line Patch Panel		£1,500
C.	FACILITIES CONTROL		
1.	Patch Panel	4,800	
2.	Telegraph-Monitoring Equipment	1,100	
3.	Test Receiver	1,180	
4.	Telegraph Repeater	710	
5.	Tables	70	
6.	Installation	1,820	
	Facilities Control Sub-total	9,680	£9,680
D.	WORK SHOP		
1.	Work-Benches		
2.	Test Equipment		
3.	Tools		
	Sub-total	1,510	£1,510

		Sub-total £	TOTAL COST
E.	TELEGRAPH SWITCHBOARD for circuit Switching, switchboard 20/200 (Siemens) Installation Cost (20% of cost)	2,726	£2,726
F.	SCREEN ROOM FOR RED AREA		£20,500
	Total cost of all Equipments		£122,216
G.	Transportation cost 7% of total		£8,500
H.	CONTINGENCIES 10% of total		£12,222
	GRAND TOTAL COST OF EVERE SWITCHING CENTER		£142,938
	rounded to		£143,000

PART II

UNITED KINGDOM SWITCHING CENTER

I. SITE PREPARATION COSTS

Electrical Screening	£8,000	
Air Conditioning and Heating	3,000	
Light and Power Distribution	3,500	
Black Windows and Refurbish Interior	2,500	
TOTAL Site Preparation Costs		£17,000

II. INSTALLATION COSTS

CPO Installation of Equipment	£2,500	
Patch Panel	2,000	
Sub-total Telegraph Installation		£4,500
Power Distribution Switches	1,000	
Voltage regulators	1,000	
No Break Power Equipment	20,000	
Building for No Break Power	1,000	
Sub-total Power		£23,000
TOTAL Installation Costs		£27,500
TOTAL United Kingdom Switching Center		£44,500
Contingency 10%		£4,450
GRAND TOTAL		£48,950
say		£49,000

PART III

NATIONAL TRIBUTARIES AND MNC's

I. NATIONAL TRIBUTARIES

BELGIUM CANADA DENMARK GERMANY GREECE
ICELAND ITALY LUXEMBOURG NETHERLANDS NORWAY
PORTUGAL TURKEY UK US

TOTAL National Tributaries	£40,000

II. MNC TRIBUTARIES

CINCHAN	SACLANT	SACEUR
TOTAL MNC Tributaries		£3,500
	Contingency	£6,500
	GRAND TOTAL	£50,000

PART IV

CRYPTOGRAPHIC EQUIPMENT REQUIREMENTS

The Working Group of National Communications Experts previously reviewed the NATO military TROL requirements. Their report in AC/4(WG/18)-62, dated 31st May, 1967, contains the requirements for NCREP Concenter and HICOM but included no provision for the NATO-wide Communications System. The following requirements are those of the NATO-wide Communications System and should be added to these previously reported.

		DUPLEX POSITIONS	
I.	EVERE SWITCHING CENTER AND TERMINAL		
(a)	Circuits to 4 MODs	12	
(b)	Circuits to 3 MNC's	6	
(c)	Teleconference Facility	2(1)	
(d)	Circuits to United Kingdom Switching Center (1)	2	
	Sub-total	22	
(e)	10% Technical Standby	2	
	TOTAL EVERE	24	23
II.	UNITED KINGDOM SWITCHING CENTER		
(a)	Circuits to 11 MODs	11	
(b)	Circuits to 3 MNC's	6	
(c)	Circuits to [illegible]	6	
	Sub-total	23	
(d)	10% Technical Standby	2	
	TOTAL UNITED KINGDOM	25	25
III.	TRIDENTALS		
(a)	11 MODs	28	
(b)	3 MNC's	6	
	Sub-total	34	34
IV.	NATO HQ to United Kingdom Switching Center	2	2
	GRAND TOTAL		84

(1) Replace by secure cable.

PART V

RADIO RELAY [illegible]VERE - CASTEAU

1.	2 Radio Terminals (normal + standby) including antenna and changeover device	£16,500
2.	1 Repeater	14,200
3.	Telephone multiplex Equipment 2x12 channel terminals	6,200
4.	Telegraph multiplex Equipment 2x18 channel terminals	10,100
	Sub-total	47,000
4.	Spare Parts for Items 1 to 3	4,000
5.	Transportation and Installation	5,400
		56,400
6.	Contingencies 10%	5,600
	TOTAL	£62,000

SUMMARY COST ESTIMATE

1.	Evere Switching Center	£115,000
2.	United Kingdom Switching Center	£19,000
3.	National Tributaries and NMC's	£50,000
4.	On Line TROL, 84 terminals (estimated cost approximately £650,000 proposed for inclusion in NATO military procurement programme, Slices XV, XVI, XVII)	0
5.	Radio relay Evere - Casteau	£62,000
6.	Management cost (reference AC/35(PP)D/7353)	£20,358
	TOTAL	£326,358

Position of the Belgian Expert

Please indicate in the summary record of the meeting in question a reservation by the Belgian Representative concerning the Evère-Casteau radio relay project. This reservation is the subject of the following comments:

(1) the very principle of setting up the proposed radio relay confronts the Belgian Government with legal problems (e.g. with regard to the operation of the relay on the Council's behalf) which will have to be the subject of a thorough study and an official pronouncement;

(2) from the purely technical viewpoint, the Belgian Defence Ministry is opposed as a matter of principle to the establishment of the relay since this would be against last January's agreement with International Staff Representatives under which NATO was not to install any radio equipment at the temporary Evère site because of reciprocal interference between such equipment and the many national military communications installations in the immediate vicinity of the NATO site.

However, the Belgian Defence Ministry is prepared to examine these technical problems in greater detail with the Project Management Team.