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***1** In the Matter of
AMERICAN TELEPHONE AND TELEGRAPH COMPANY
FTC COMMUNICATIONS, INC.
GTE SPRINT COMMUNICATIONS CORPORATION
HAWAIIAN TELEPHONE COMPANY
ITT WORLD COMMUNICATIONS INC.
MCI INTERNATIONAL, INC.
RCA GLOBAL COMMUNICATIONS, INC.
THE WESTERN UNION TELEGRAPH COMPANY
TRT TELECOMMUNICATIONS CORPORATION
Application for Authorization Under Section 214 of the Communications Act of 1934, as Amended, to Construct and Operate High Capacity Digital Submarine Cable Systems Between and Among the Mainland of the United States, the Island of Oahu in the State of Hawaii, the Island of Guam, Japan and the Island of Luzon, Philippines

File No. **I-T-C-85-219**

MEMORANDUM OPINION, ORDER AND AUTHORIZATION

Adopted December 17, 1985; Released January 7, 1986

By the Common Carrier Bureau:

1. The Commission has before it an application filed by several U.S. common carriers (Applicants) for authority pursuant to Section 214 of the Communications Act, 47 U.S.C. 214, to construct and operate interconnecting high capacity digital submarine cable systems, Hawaii-4/Transpac-3 (HAW-4/TPC-3) and Guam-Philippines-2 (GP-2) between and among the U.S. Mainland, Hawaii, Guam, Japan and the Philippines. [FN1] The Applicants also request authority to assign and activate circuits in these cable systems and to acquire by lease connecting facilities necessary to extend the cable capacity to points set forth in the Applicants' circuit activation plans.

2. The application was placed on the Commission's September 11, 1985 public notice of applications accepted for filing. Only the State of Hawaii filed comments in response to the application.

I. Background

3. The instant application concludes Phase II of the long-range comprehensive planning process that was initiated in CC Docket No. 81-343 to determine the need for additional facilities in the Pacific Ocean Region (POR). Phase I of the proceeding focused on facility needs for the POR for the 1982-1986 time period. [FN2] Phase I dealt primarily with issues involving the Australia-New Zealand-

Canada submarine cable (ANZCAN). The result of Phase I was the authorization of U.S. carriers to participate in the ANZCAN cable with a mix of permanent (ownership) and temporary indefeasible right of user (IRU) interests. The Commission envisioned that the temporary IRUs would terminate in the late 1980's at which time the traffic would be routed over a fiber optic HAW-4 cable.

4. Phase II of the POR Planning Process was initiated on November 21, 1983 with a Notice of Inquiry (NOI), [FN3] followed by a Further Notice of Proposed Rulemaking (Further Notice) released on March 28, 1985 [FN4] and a Report and Order released August 22, 1985. [FN5] Phase II of the POR planning process focused on facilities needs in the POR during the 1987-1995 time period and particularly on the need for and timing of a fiber optic transpacific cable. In connection with Phase II, carriers submitted distribution plans for a number of facility proposals with varying designs and ready-for-service dates.

***2** 5. In the Phase II Report and Order several factors were analyzed in order to determine the need for, design and timing of any proposed facility or group of facilities. Among the factors considered were demand, the introduction of new technology, the development of intermodal and intramodal competition, service quality, cost, technological risk, correspondent acceptance, U.S. industrial interests and national security.

6. After weighing these factors, the Report and Order concluded that the public interest would be best served by the introduction of a fiber optic cable in the POR as early as 1988. The Report and Order expressed a preference for the cable described in Plan II-A (Mod. 4). [FN6] With respect to the issue of demand, the Report and Order recognized that existing and planned capacity would be sufficient to handle forecasted demand through 1991 without the introduction of a new fiber optic cable. However, this analysis assumed the introduction of INTEL SAT-VA satellites in the POR in 1987 as the Primary and Major Path satellites, the retention of an INTEL SAT-VA satellite as the spare, and the use of CFDM and 64 Kbps TDMA/DSI. [FN7] The Report and Order questioned the continued validity of these assumptions in light of recent developments. Specifically, the Report and Order noted that the INTEL SAT-VA satellites to be introduced in the Pacific would remain in operation in the Indian Ocean Region (IOR) until INTEL SAT VI satellites are launched in the IOR which may not occur until 1988 or 1989. Thus, the INTEL SAT VA satellites would not be introduced until 1988 or as late as 1989 instead of 1987 as earlier projected. The Report and Order also questioned whether INTEL SAT would deploy a Major Path satellite in the POR in light of launch or satellite failures, and demand and service requirements and other factors. In light of these factors, the Report and Order concluded that a demand for a TPC-3 cable could materialize as early as 1988, particularly in light of customer requirements for cable circuits where security, and the lowest possible interference and error rates are required. While recognizing that most of the services to be provided over a TPC-3 could be provided via satellite, the Report and Order noted that due to reduced noise, error and absolute delay relative to satellite, some services

such as high speed data are better suited for cable. Also, it noted that some private line customers prefer cable to satellite and fiber optic to analog cable designs. Because most of the cables in the POR are saturated, the Report and Order concluded that a TPC-3 cable may be necessary to fulfill the explicit demand for these types of services.

7. The Report and Order concluded further that both intermodal and intramodal competition would be advanced. In this regard, the Report and Order noted that over 70% of all traffic in the POR is routed over satellite facilities and all growth with the exception of traffic to Australia and New Zealand must be placed over satellite circuits. With the introduction of TPC-3, digital submarine cables will become a competitor for new traffic growth and new services in the region.

***3** 8. The introduction of a new fiber optic cable in the POR was also found to increase service quality. In considering service quality, the Report and Order looked at diversity (path and media), restoration, and loading. With respect to path diversity, the introduction of a TPC-3 cable as early as 1988 with a ring configuration was found to enhance path diversity by adding another major route to the two satellite and three cable paths (TPC-1, TPC-2 and ANZCAN) in the POR. Media diversity was also found to be improved with the addition of a TPC-3 cable in 1988 since currently approximately 70% of all traffic and all growth traffic is routed over satellite. Media diversity would be improved by 24% with the introduction of a TPC-3 cable in 1988. Restoration capability was found to be improved with the introduction of a transpacific lightguide cable in 1988 since the TPC-3 cable would be able to restore the TPC-1, TPC-2 cables and satellite services (on a geographically limited basis). Moreover, since the ring design of the entire system would allow the cable to be self-restoring, in part or in whole west of the branching unit, a TPC-3 cable was found to be critical as a means of restoring certain cable-only services.

9. The Report and Order also adopted a loading methodology for AT & T. [FN8] Although several loading methodologies were suggested, the Report and Order adopted a variation of the phase-in plan proposed by ITTWC. Under the plan, AT & T would be allowed 8% flexibility for 1988 and then 4% for the next three years. The result would be an average of about 65% of all traffic growth being routed over cable for the years 1988-1991, with a cable satellite ratio of 44/56 in 1991.

10. On the issue of costs, the Report and Order concluded that AT & T's interest in the $980 million TPC-3 would result in an added overall revenue requirement of approximately $100 million for the first year if considered independent of other factors. However, the figure would be partially offset by lower ownership expenses in the ANZCAN North cable, reduced satellite expenses and transiting revenues paid by foreign administrations using U.S. domestic facilities to carry traffic to and from the TPC-3 cable. When the effect of these and other factors were balanced against the projected increase in revenue requirement, it was estim-

ated that the actual revenue impact from the building of a TPC-3 cable would be an increase by as much as $66 to $85 million per year from 1988 through 1990.

11. The Report and Order also found that a delay in the introduction of the cable until 1991 would result in some cost savings (approximately $45 million). However, these savings are not likely to be so dramatic as to outweigh the advantages of activating the cable in 1988. And, based on the experience to be gained with fiber optic technology in the North Atlantic with the TAT-8 cable and other systems installed prior to TAT-8 cable, the Report and Order found no technological risk in introducing a TPC-3 cable in 1988. Also, it was noted that foreign correspondents favored Plan II-A (Mod. 4) in 1988. From a national security standpoint a Guam landing of the cable was found to be in the public interest.

***4** 12. Finally, on the issue of U.S. industry participation in the design and construction of the TPC-3 cable, the Report and Order concluded that the draft HAW-4/TPC-3 Construction and Maintenance Agreement (C & MA) is favorable to U.S. interests. Specifically, it noted that U.S. companies will construct the HAW-4 cable as well as that portion of TPC-3 from Hawaii to the branching unit. In all, U.S. participation represented a total of 5115 miles or 71.5% of the total cable length and 72.5% of the contract award. It was also determined that a delay until 1991 would probably not result in a more advantageous position for U.S. industrial interests.

II. Description of Proposed Facilities

13. The proposed HAW-4/TPC-3 cable system will extend between landing points at the existing cable stations at Point Arena, California; Makaha, on the island of Oahu, Hawaii; Tanguisson on the island of Guam; and a new cable station to be constructed at Boso, Japan. The GP-2 cable system will connect at Tanguisson and extend to Baler, on the island of Luzon, the Philippines. The cable includes a branching unit west of Hawaii which incorporates a shore controlled power path switch allowing for the cable to be series powered from Makaha for either a Guam or Japan landing. [FN9] The systems will be connected in the United States, Guam, Japan and the Philippines with the respective domestic networks in those countries and territories. In addition, the HAW-4/TPC-3 and GP-2 cable systems will be extended by suitable facilities to the borders of other countries participating in the HAW-4/TPC-3 and GP-2 cable systems or to the terminals of other international communications systems, including other cable terminals and satellite earth stations enabling the HAW-4/TPC-3 and GP-2 cable systems to be used for services between the United States and beyond, on the one hand, and Guam, the Philippines and Japan and beyond, on the other hand.

14. The Applicants and other co-owners of the HAW-4/TPC-3 and GP-2 cable systems have entered into separate Construction and Maintenance Agreements (C & MA) which describe in greater detail the cable systems' components and which set forth the rights and obligations of the co-owners with respect to the ownership, construc-

tion, operation maintenance and use of the cable. Upon obtaining the requisite governmental approvals, the parties will formally execute the C & MAs in mid-January 1986. As described in the HAW-4/TPC-3 C & MA, the proposed system will consist of six segments: A, B, C, D, E and F. Segments C and D also contain subsegments. Segment A consists of the cable station at Port Arena, California. Segment B consists of the whole of the HAW-4 submarine cable between the cable stations at Point Arena, California and Makaha, Hawaii (Segment C) and two lightguide pairs. Segment B also consists of the nominal 140 mbit/s digital input/output points at the Point Arena and Makaha cable stations. Subsegment C1 consists of that part of the Makaha cable station associated with Segment B (HAW-4 cable) while Subsegment C2 consists of that part of the Makaha cable station associated with Segment D (TPC-3 cable). Segment D consists of the whole of the TPC-3 submarine cable, between and among the cable stations at Makaha, Boso, Japan (Segment E) and Tanguisson, Guam (Segment F), including 140 mbit/s digital input/output ports at these cable stations. Segment D is further subdivided into Subsegments D1, D2 and D3. Subsegment D1 consists of that part of Segment D between the nominal 140 mbit/s digital input/output ports at the Makaha cable station and the branching unit, including a one-third portion of the branching unit. Subsegment D2 consists of that part of Segment D between the branching unit, and the nominal 140 mbit/s digital input/output points at the Boso, Japan cable station, including a one-third portion of the branching unit. Subsequent D3 consists of that part of Segment D between the branching unit and the nominal 140 mbit/s digital input/output points at the Tanguisson cable station, including a one-third portion of the branching unit.

***5** 15. The HAW-4/TPC-3 C & MA was initialed by ten U.S., one Canadian and twelve foreign co-owners of the system. [FN10] Under the terms of the HAW-4/TPC-3 C & MA, the co-owners have selected AT & T to supply Segment B and the major portion of Subsegment D1, and Kokusai Denshin Denwa Co., Ltd., (KDD) to supply the branching unit, Subsegments D2 and D3, and a small part of Subsegment D1. AT & T has also been selected by the co-owners to coordinate the activities of the two suppliers in matters pertaining to the operating compatibility of the subsegments of Segment D.

16. The portion of the HAW-4/TPC-3 cable supplied by AT & T will use AT & T's SL design. The SL design incorporates two working lightguide pair transmission paths with associated regenerators and supervisory circuits. A transmission path to be used only for standby, capable of being switched between repeaters, is also provided. The SL deep-sea cable structure consists of: (1) a unit fiber structure of six lightguides in a helical path embodied in an extruded elastomer surrounding a king wire with a nylon overjacket; (2) a DC power conductor/strength member of a double layer of strength wires over the unit fiber structure, overclad with a continuously welded swaged copper tube; and (3) polyethylene insulation over the copper tube.

17. The portion of the HAW-4/TPC-3 cable being supplied by KDD will use KDD's OS-

280M design. The OS-280M design incorporates two working lightguide pair transmission paths in the cable with associated regenerators and supervisory circuits. The OS-280M deep-sea cable structure consists of: (1) a unit fiber structure of four lightguides embedded into resin while the inside of the cable itself is filled with soft compounds; (2) a DC power conductor/strength member of stranded steel wire over the unit fiber structure, overclad with a copper tube; and (3) polyethylene insulation over the copper tube.

18. The terminal transmission equipment and the high voltage power feed equipment of the SL and OS-280M designs use redundant equipment with automatic protection switching, as has been used on previous analog submarine cable systems. The SL design provides for regenerator section-by-section redundancy and the SL and OS-280M designs provide laser transmitter redundancy. The SL regenerator section-by-section redundancy is accomplished by the provision of a standby-only lightguide pair, its associated regenerators and the protection switching in the repeaters.

19. The branching unit, which will be of KDD's OS-280M design, incorporates a shore controlled power path switch allowing the cable to be series powered from Makaha to either a Guam or Japan landing. The other branch will be powered from its landing to a cathodic sea ground at the branching unit. The HAW-4/TPC-3 cable system will be armored where required in shallow water. Also, in order to protect it from damage due to fishing activities, the cable will be buried where required.

***6** 20. Between the U.S. Mainland and Hawaii, the HAW-4/TPC-3 cable system will consist of two working lightguide pairs between Point Arena and Makaha. The maximum capacity of this system is provided in four 140 mbit/s streams, two in each lightguide pair, with each 140 mbit/s stream containing 1890 Minimum Assignable Units of Ownership (MAUOs). [FN11] This segment of the system will have a maximum total capacity of 7560 MAUOs. For voice telephone requirements, digital circuit multiplication systems (DCMS) can be applied to derive nominally five voice paths from each MAUO. Between Hawaii and the Western Pacific, the HAW-4/TPC-3 cable system consists of two working lightguide pairs, one pair between Makaha and Boso (via Subsegments D1 and D2) and one pair between Makaha and Tanguisson (via Subsegments D1 and D3). The capacity of this portion of the system is provided in four 140 mbit/s streams, two in each lightguide pair, with each 140 mbit/s stream containing 1890 MAUOs. This portion of the TPC-3 system will have a maximum total capacity of 7560 MAUOs. Between Japan and Guam, the HAW-4/TPC-3 cable system consists of one working fiber pair between Boso and Tanguisson (via Subsegments D2 and D3). The capacity of this portion of the system is two 140 mbit/s streams, with each 140 mbit/s stream containing 1890 MAUOs. This portion of the TPC-3 system will have a maximum total capacity of 3780 MAUOs.

21. The C & MA for the GP-2 cable system was initialed by the eight United States, [FN12] one Canadian and eight foreign overseas co-owners of the system on

April 24, 1985. The GP-2 cable system is divided into three segments: Segment A includes a share of the cable station at Baler; Segment B includes the whole of the submarine cable system between and including the nominal 140 mbit/s digital input/output ports at the Segment A and C cable stations; Segment C includes a share of the cable station at Tanguisson.

22. The GP-2 cable system co-owners have selected AT & T to supply Segment B of the cable system. Segment B will use AT & T's SL design incorporating one working lightguide transmission path with associated regenerators and supervisory circuits. A standby-only transmission path capable of being switched between repeaters is also provided. The SL deep-sea cable structure will consist of: (1) a unit fiber structure of four lightguides in a helical path embedded in an extruded elastomer surrounding a king wire with a nylon overjacket; (2) a DC power conductor/strength member of a double layer of strength wires over the unit fiber structure, overclad with a continuously welded swaged copper tube; and (3) polyethylene insulation over the copper tube.

23. The terminal transmission equipment and the high voltage power feed equipment of the SL design uses redundant equipment with automatic protection switching, as has been used on previous analog submarine cable systems. The SL design provides for regenerator section-by-section redundancy. The regenerator section-by-section redundancy is accomplished by the provision of a standby-only lightguide pair, its associated regenerators and the protection switching in the repeaters. The GP-2 cable system will be armored where required in shallow water.

***7** 24. Deployment of the HAW-4/TPC-3 and GP-2 cable systems will necessitate resolution of the problem of interworking between the different digital standards of North America and the POR. In order to permit the interconnection of these different national digital networks, the hybrid digital hierarchy for international interworking, CCITT Recommendation G.802, will be employed. When required, the A law to Mu law conversion function will be performed in North America in accordance with CCITT Recommendation G.711.

III. Allocation of Capacity Costs and Ownership Interest

25. The C & MAs sets forth how the capacity, costs and ownership interests in the HAW-4/TPC-3 and GP-2 cable systems will be allocated among the various parties. Under the HAW-4/TPC-3 C & MA, the capacity will be owned by the Applicants in accordance with the following voting percentages: AT & T-56.37%; FTCC-.07%; GTE Sprint-1.04%; HTC-.90%; ITT-1.26%; MCII-1.31%; RCA-1.57%; TRT-.18%; and WU-.44%.

26. Under the terms of the GP-2 C & MA, the three segments of the cable will be owned by U.S. entities in the following proportions: AT & T-43.6%; HTC-.71%; ITT-.48%; MCII-.40%; RCA-.95%; TRT-.05%; and WU-.19%. The remaining ownership interests will be held jointly by the non-U.S. co-owners.

27. The configuration of HAW-4/TPC-3 cable system selected by the co-owners to be provided by AT & T and KDD under separate contracts is currently estimated to have a total cost of $593 million (in January 1987 U.S. Dollars). This sum includes common plant (land and buildings) at the cable stations. This estimated cost does not include interest during construction. [FN13] About 90% of the costs of the HAW-4/TPC-3 cable system will be on a fixed price basis. The remaining 10% of the costs will be on either a cost-incurred or fixed-cost plus escalation-for-raw-materials basis. Items such as the cable and cable laying, the repeaters, the branching unit costs, the terminal transmission equipment and the high voltage power plant will be furnished on a fixed price basis. Items such as the route survey, burying of the cable, project management, owners' inspection and amounts payable for customs duties and value added taxes will be handled on a cost-incurred basis.

28. The GP-2 cable system is to be constructed entirely by AT & T and is estimated to cost $107 million. This estimated cost does not include interest during construction. [FN14] About 90% of the costs of the GP-2 cable system will be on a fixed price basis. The remaining 10% of the costs will be on either a cost-incurred or fixed-cost plus escalation-for-raw-materials basis.

29. Under the terms of the C & MAs the co-owners will bear the capital, operating and maintenance costs of the HAW-4/TPC-3 cable system in accordance with Attachment B, Schedule C, and the cost of the GP-2 cable system in accordance with Attachment D, Schedule C. Under these schedules the Applicants will bear approximately 60.6 percent of the $700.4 million estimated capital costs for the entire HAW-4/TPC-3 and GP-2 cable systems in the individual proportions set forth in paragraphs 25 and 26 herein. By comparison, U.S. industry will provide approximately 72.5 percent of the estimated capital costs of HAW-4/TPC-3 and GP-2 cable systems.

***8** 30. The Applicants have also provided regional and country-by-country circuit activation plans for the HAW-4/TPC-3 and GP-2 cable systems. These plans show the projected use of circuits for the 1987-1991 time period to each country. The co-owners have allocated the difference between the design capacity of the cable systems and their aggregate requirements in each lightguide pair to the parties in whose country the segment terminates. Under this approach the Applicants are the terminal country co-owners of capacity in those segments of HAW-4/TPC-3 and GP-2 cable systems that terminate on the U.S. Mainland, Hawaii and Guam. This capacity will be used to accommodate the needs of other U.S. carriers and to provide service to countries that have no ownership interest in the cable through conveyances by the terminal country co-owners to non-owners on an Indefeasible Right of User (IRU) basis. The Applicants state that there will be sufficient capacity available in the initial years of service of HAW-4/TPC-3 and GP-2 cable systems to accommodate the needs of other U.S. carriers and countries that are not co-owners but have, or will in the future identify, a need to use the HAW-4/TPC-3 and GP-2 cable systems. The C & MAs also contain a provision permitting the assignment of

capacity in the HAW-4/TPC-3 and GP-2 cable systems between co-owners and others.

IV. Comments

31. The State of Hawaii (State) filed comments in response to the application. The State does not oppose the construction of the HAW-4/TPC-3 cable system. However, the State is concerned about the consequences that a new Pacific cable facility will have on rates paid by telecommunications users, particularly since the Commission's Phase II Report and Order relied heavily on factors other than demand in concluding that a new cable facility is needed. The State is therefore concerned that it share in the benefits of this cable system and not be burdened with a disproportionate share of the costs. In particular, the State hopes that it will be served by national carriers using the cable and that the carriers provide a full-range of services at reasonable and non-discriminatory rates.

V. Discussion

32. At the outset we emphasize that the issues concerning the need for and timing of facilities in the POR through the period 1981-1995 have been exhaustively considered in Phase I and Phase II of the comprehensive planning process in CC Docket No. 81-343. Phase II of the planning process resulted in the conclusion that the public convenience would best be served by the introduction of a HAW-4/TPC-3 fiber optic cable as early as 1988. As envisioned in the Phase II Report and Order, the HAW-4/TPC-3 cable system would be the hub of comprehensive cable network which would eventually form a ring design upon completion at a later date of other smaller cables. [FN15] In reaching this conclusion, the Commission considered inter alia, questions of demand, service quality, circuit allocations, costs, and impact on U.S. industrial interests. The instant application represents the result of that planning process and the conclusions reached therein.

***9** 33. Although we decided in the Phase II Report and Order in Docket No. 81-343 that a HAW-4/TPC-3 cable introduced in 1988 would serve the public interest, we are required to make a determination under Section 214 of the Communications Act that the public convenience and necessity will be served by authorization of the requested facilities. The standard to be employed in such cases is "whether the specific facility chosen and the use to be made of that facility are required by the public convenience and necessity." AT & T Co. (TAT-7), 73 FCC 2d 248, 256 (1979). In making this determination we consider questions of (1) demand, (2) service quality, (3) costs, (4) circuit allocation and activation, and (5) U.S. industrial interests. Since circumstances have not changed significantly since the Phase II Report and Order, the conclusions reached herein with respect to these issues essentially follow the analysis of the Report and Order.

A. Demand

34. In the course of CC Docket No. 81-343 it was established that there are ex-

isting facilities in place to meet traffic demand without the introduction of a HAW-4/TPC-3 cable system until at least 1991. The Report and Order reached this conclusion based on an estimate that total satellite capacity in the region would number approximately 17,500 circuits while total demand in 1991 would be less than 15,000 circuits. With existing cable capacity added, total capacity for the region is much greater. However, other factors were found to weigh heavily in favor of the introduction of the HAW-4/TPC-3 and GP-2 cable systems in 1988.

35. First, the estimates of total satellite capacity have become suspect. In particular, INTEL SAT VA satellites to be introduced in the POR will be rotated from the IOR once INTEL SAT VI satellites are introduced in the IOR. Recent estimates, however, suggest that the INTEL SAT VI satellites may not be launched until 1988 or even as late as 1989. Moreover, as noted in the Report and Order, it is less clear that INTEL SAT intends to place a Major Path satellite in the POR. With the uncertainty of launch and operational failures delaying deployment of INTEL SAT VA satellites in the POR, the number of satellite circuits originally projected to be available for POR traffic requirements in 1988 would be lowered further. Thus, depending on how these factors are resolved, available satellite capacity could range from 4350 to 17,500 circuits. Satellite demand without a TPC-3 cable in 1988 is forecasted at 6450 circuits. We also anticipate that our foreign partners in the Pacific region will be entering into operating agreements with additional U.S. carriers and service providers. Additional competition among U.S. entities frequently stimulates demand and increases the need for additional facilities.

36. In addition, there are other concerns which counterbalance the results of the demand projections. Introduction of a HAW-4/TPC-3 cable system will mean the introduction of digital fiber optic technology with its attendant service benefits. Besides providing improved service characteristics, the HAW-4/TPC-3 cable system's digital technology will provide an important interconnection between the various developing domestic digital networks in the countries linked by HAW-4/TPC-3. By accommodating new services, this international digital capability will spur the development of domestic digital systems. The development of, and demand for, new digitalized services could very well stimulate circuit demand beyond that projected in our traffic forecasts. Moreover, the lower circuit costs of the HAW-4/TPC-3 cable system should exert a beneficial downward pressure on the rates for international arrangements under which U.S. firms' participation totals some 60% of the cost. After weighing these benefits against the arguments for delaying the cable until projected demand would require it, we conclude that the benefits of introducing the cable in 1988 outweigh the comparatively speculative benefits of delay.

***10** B. Service Quality

37. We conclude that the introduction of the HAW-4/TPC-3 and GP-2 cable systems in 1988 will add to the quality of service currently available in the POR. As

noted earlier, quality of service includes several factors such as media and path diversity, restoration and loading. On the issue of diversity, a natural consequence of adding a new facility is that both media and path diversity will be improved. In the case of a HAW-4/TPC-3 cable system to be introduced in 1988, the Report and Order concluded that media diversity would be improved since it would relieve the current situation under which all growth traffic in the POR is provided over satellite facilities. Moreover, by adding another separate and distinct route, path diversity would also be improved. Closely related to the issue of diversity is restoration. Clearly, the more diverse routes in place for traffic distribution, the greater the capacity to accommodate an interruption in service on a given facility. The introduction of the TPC-3 cable in 1988 will improve service quality by adding greater restoration capability in case of an outage of the TPC-1 and TPC-2 cables and to a limited degree satellite facilities. Moreover, because of the ring design of the proposed network, the HAW-4/TPC-3 cable system is capable of restoring itself in part or in whole west of the branching unit. This feature is particularly significant when dealing with certain high speed data services better suited for cable, or where a customer has designated a cable circuit for its traffic based on a particular characteristic of cable facilities such as better security and bit/error rates.

C. Costs

38. The HAW-4/TPC-3 cable system is expected to cost $593 million while the cost of GP-2 cable system is estimated at $107 million. These cost estimates do not include interest during construction which is estimated to be $40.7 million and $6.5 million for the HAW-4/TPC-3 and GP-2 cable systems, respectively. Of the approximately $700 million cost of these cable systems, U.S. carriers will bear approximately 60%. Because AT & T is the single largest user of circuits in the POR and has a combined ownership interest of approximately 56% in the two cable systems, any consideration of costs is primarily directed at AT & T. In particular, the Report and Order focused on the costs to ratepayers resulting from AT & T's participation in a TPC-3 cable and the potential savings to be gained from delaying the introduction of the cable until 1991.

39. With respect to the former, the Report and Order concluded that AT & T's participation would result in a "theoretical" added overall revenue requirement (return on investment plus taxes and expenses) of approximately $100 million for the first year the cable is in operation. However, this figure would be partially offset by reduced ownership in ANZCAN cable circuits, reduced satellite lease expenses and by increased transiting revenues from foreign administrations using U.S. domestic facilities to carry traffic to and from the TPC-3 cable. These expenses were estimated at $101 million for the years 1988-1990, or an average of approximately $34 million per year. [FN16]

***11** 40. The Report and Order, estimated the costs of TPC-3 at approximately $733 million in 1983 dollars which would add up to $980 million in 1988 dollars assum-

ing a 6% rate of inflation. AT & T's share was estimated to be approximately $425 million in 1988 dollars. These figures were relied on in analyzing the potential increase in AT & T's revenue requirement. The instant application estimates the cost of the HAW-4/TPC-3 cable system at $593 million and the GP-2 cable at $107 million in January 1987 dollars. AT & T's share of the HAW-4/TPC-3 cable system would be $334.3 million and $46.7 million for the GP-2 cable system. Thus, AT & T's total cost for these systems would be $381 million in 1987 dollars. Assuming a 6% rate of inflation, AT & T's costs would be approximately $404 million in 1988 dollars. As we found in the Report and Order, some costs savings could be recognized by delaying introduction of the cable until 1991, but these savings would not be so significant as to outweigh the benefits of a 1988 service introduction date. Overall, we find that the increase in AT & T's revenue requirement is more than offset by the benefits to be derived from constructing the cable.

D. Allocation and Activation

41. A schedule for the allocation of the circuits in the HAW-4/TPC-3 and GP-2 cable systems is enclosed as Attachment 2. Under the terms of the C & MAs, capacity in excess of projected need will be held by the terminal country carriers in proportion to total ownership. The facilities may be made available to other U.S. carriers and entities on an IRU basis. The availability of cable circuits in this manner should further competition by allowing low-cost cable facilities to be made available to potential entrants. The lower per circuit costs of HAW-4/TPC-3 and GP-2 cable circuits as compared to previous transpacific cable facilities may spur new entry and service offerings to Hawaii and the POR in general. [FN17] As in the case of previous cable systems, we are hereby requiring that capacity in these cable systems be made available on a non-discriminatory basis to carriers. Whether IRUs shall be made available to non-carriers will be decided in our proceeding in CC Docket No. 83-1230, International Communications Policies Governing RPOAs, IRUs and DNICs, Notice of Proposed Rulemaking, FCC 85-369, released August 19, 1985.

42. Each of the Applicants has filed circuit activation plans showing the use of cable and satellite circuits through 1991. While these activations are illustrative of how the new cable system would be used, particularly in its early years of operation, we are primarily concerned with activations for AT & T. Because of its extensive use of POR facilities, only AT & T's circuit utilization is subject to a loading methodology. Under the modified phase-in loading methodology approved by the Commission, AT & T is permitted 8% flexibility in 1988 and 4% for the next three years. Our analysis of the activation plan submitted by AT & T indicates that its plan is consistent with the modified phase-in plan adopted in the Report and Order. For example, in 1987 (one year before activation of the HAW-4/TPC-3 cable) AT & T's plan estimates that a total of 5899 circuits will be activated in the POR. Of the 5899 circuits, 4473 (75.8%) will be satellite and 1426 (24.2%) will be cable. Consistent with the 8% flexibility allowed for the

cable in the first year of operation, AT & T's percentage of cable circuit use will grow to 32% (2173) in 1988 compared to 68% (4618) satellite circuit usage. For the years 1989-1991 AT & T's cable/satellite usage is estimated at 36/64 in 1989, 40/60 in 1990 and 44/56 in 1991. We therefore find that the activation plans submitted by AT & T and the remaining applicants are consistent with our determination in the Phase II Report and Order and are in the public interest. The Applicants will be expected to file applications for the acquisition of satellite circuits consistent with the plans submitted herein.

***12** E. U.S. Industrial Interests

43. Under the draft C & MA's for the HAW-4/TPC-3 and GP-2 cable systems, U.S. firms will be responsible for the design and construction of approximately 72.5% of the cable systems. This arrangement clearly favors U.S. industrial interests and will ensure that U.S. cable technology retains a preeminant position in the cable construction industry. The only issue is whether delaying the introduction of these cable systems until 1991 would affect the arrangements as specified in the C & MAs. While the effect of such a delay would be difficult to quantify, it is hard to imagine how U.S. industrial interests would be benefitted by such a delay. The arrangements for the construction of the cable are in place based on a 1988 service date. Any delay in the introduction of the cable could jeopardize these arrangements and ultimately result in a foreign entity being awarded a share of the contracts earmarked for U.S. industrial interests.

F. Miscellaneous Considerations

44. Grant of this application will not constitute a major action within the meaning of Section 1.1305 of the Commission's Rules and Regulations implementing the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4347 (1976). See Report and Order, 49 FCC 2d 1313, 1320 (1974) (laying of submarine cable and installation of additional cable over existing routes not "major action"). Consequently, no environmental information is required as part of the application.

G. Conclusion

45. After consideration of the instant application to construct and operate the HAW-4/TPC-3 and GP-2 cable systems, we find that the proposal is fully consistent with the Commission's policy objectives expressed in the Phase II Report and Order and the ultimate conclusion that the introduction of submarine cable systems in the POR as early as 1988 is in the public interest. We find here that the proposed systems are required to satisfy the service preferences and needs of users, particularly those for whom security is essential and lowest possible interference and error rates are needed, and they may also be required as early as 1988 in order to satisfy forecasted demand in the POR. The systems will also introduce digital technology to the POR, permitting interconnection with a rapidly-developing global digital network, and promote technological development and customer choice.

46. The introduction of this new technology in the POR will sharpen intermodal and intramodal competition, by supplementing existing POR cable capacity that is essentially saturated, except for the ANZCAN cable, thereby creating incentives for more efficient operations by all facilities suppliers in the POR. The introduction of new technology in the region will also provide significant cost savings on a per circuit basis compared to per circuit costs of previous transpacific cables. It will also provide service quality benefits in terms of path diversity, media diversity, and restoration capability. The proposed systems also meet international comity concerns, [FN18] the needs of national security, and benefit the U.S. economy as a whole and will preserve the leading role of U.S. industry in lightwave cable system technology.

***13** 47. Upon consideration of the application, we find that the present and future public interest, convenience and necessity require the construction and operation of the HAW-4/TPC-3 and GP-2 cable systems described herein.

48. Accordingly, IT IS ORDERED that the application be GRANTED, subject to the following terms, conditions, and limitations and the Applicants are authorized to:

(a) construct and operate the HAW-4/TPC-3 and GP-2 cable systems as proposed herein;

(b) assign the capacity of the HAW-4/TPC-3 and GP-2 cable systems as set forth herein;

(c) acquire transit facilities on a lease basis;

(d) activate circuits according to the activation plans submitted;

(e) subdivide the circuits authorized herein in accordance with any Commission orders authorizing applicants to utilize digital circuit multiplication equipment to derive additional voice paths from authorized capacity; and

(f) acquire connecting facilities between the Point Arena, Makaha and Tanguisson cable stations and their respective operating offices in the United States and its territories.

49. IT IS FURTHER ORDERED, that when a given applicant seeks to acquire or transfer an ownership or IRU interest in HAW-4/TPC-3 capacity, the reimbursement it receives shall be on the basis of depreciated original cost (or the pro rated accumulated cost of such circuit if the system is not then operational) or in conformance with such policy as the Commission may develop in the future regarding the price at which IRU's will be made available.

50. IT IS FURTHER ORDERED, that the applicants make available half-interests in HAW-4/TPC-3 and GP-2 capacity to such present and future U.S. carriers as may be authorized by the Commission to acquire such capacity.

51. IT IS FURTHER ORDERED, that the applicants shall make capacity in the HAW-4/TPC-3 and GP-2 systems available to non-carriers in conformance with the policies developed in CC Docket No. 83-1230.

52. IT IS FURTHER ORDERED, that the Commission retains jurisdiction to reallocate U.S. carriers' interests in capacity herein authorized, as the public interest may require to accommodate additional carriers or otherwise, with, where required, the concurrence of the foreign administration or carriers concerned, and, further, jurisdiction is retained by the Commission over all matters relating to the applicants' ownership, management, maintenance, and operation of the cable systems as authorized herein, to assure the most efficient use not only of these cable systems but of all means of communications between the U.,S. and the Pacific Ocean Region.

53. IT IS FURTHER ORDERED, that the Commission retains jurisdiction to review the DCMS, multiplexing, and interworking arrangements and attribution of the costs thereof and to require such changes in the provision of these services and equipment as may be necessary.

54. IT IS FURTHER ORDERED, that no applicant herein shall dispose of any interest in any HAW-4/TPC-3 and/or GP-2 capacity it is authorized to acquire in any way without prior authorization by the Commission. Consistent with the Commission's decision in CC Docket No. 85-107, this condition applies only to dominant carriers.

***14** 55. IT IS FURTHER ORDERED, that the applicants shall include HAW-4/TPC-3 and GP-2 facility use in the monthly Circuit Status Reports filed pursuant to the Commission's Orders. These reports shall be filed no later than the 20th day of each month providing the information for the preceding month.

56. IT IS FURTHER ORDERED, that this authorization is issued subject to the terms and conditions of any license issued to the applicants herein under the act entitled "An Act relating to the landing and operation of submarine cables in the United States" (47 U.S.C. §§ 34-39), covering the subject submarine cable, and shall become effective upon the acceptance of the aforementioned license by all such parties.

57. This order is issued under Section 0.291 of the Commission's rules and is effective upon release. Petitions for reconsideration under Section 1.106 or applications for review under Section 1.115 of the rules may be filed within 30 days of the date of public notice of this order (see Section 1.4(b)(2)).

FEDERAL COMMUNICATIONS COMMISSION
Albert Halprin

Chief Common Carrier Bureau

FN1 The applicants are American Telephone and Telegraph Company (AT & T), FTC Communications, Inc. (FTCC), GTE Sprint Communications Corporation (GTE Sprint), Hawaiian Telephone Company (HTC), ITT World Communications Inc. (ITIWC), MCI International, Inc. (MCII), RCA Global Communications, Inc. (RCAGC), The Western Union Telegraph Company (WU), and TRT Telecommunications Corporation (TRT).

FN2 Pacific Planning (Report and Order, Phase I) 47 Fed.Reg. 507040 (December 22, 1982).

FN3 Pacific Planning (Notice of Inquiry, Phase II) FCC No. 83-515, (released November 21, 1983).

FN4 Pacific Planning (Further Notice of Proposed Rulemaking, Phase II), FCC No. 85-121 (released March 28, 1985).

FN5 Pacific Planning (Second Report and Order, Phase II), FCC No. 85-457 (released August 22, 1985).

FN6 Plan II-A (Mod. 4) calls for a HAW-4/TPC-3 cable system to be introduced in 1988, a Guam-Philippines cable in 1989 and other cables which would interconnect Japan, Korea, Hong Kong, Taiwan, the Philippines and Guam to be introduced in 1990 with the exception of the Taiwan-Philippines cable leg to be introduced in 1994. When completed, a pictorial representation of this system would show a ring design west of the branching unit that allows for either a Guam or Japan landing.

FN7 CFDM (Companded Frequency Division Multiplex), TDMA (Time Division Multiple Access) and DSI (Digital Speech Interpolation) are all techniques used to make more efficient use of satellite facilities, thereby increasing capacity.

FN8 Loading is the method by which the Commission directs the placement of U.S. traffic on different media to ensure reasonable use of cable and satellite facilities and the development of the intermodal competition.

FN9 See Attachment 1.

FN10 AT & T's wholly-owned subsidiary, Transpacific Communications, Incorporated, will own portions of the cable system on behalf of AT & T.

FN11 A MAUO is defined in the C & MA as a unit of ownership designated as the minimum, practical unit of ownership, consisting of 73,684.656 bits per second. Of the 73,684.656 bits per second 64,000 are usable bits per second and the additional 9,684.656 bits per second are required for multiplexing purposes.

FN12 See note 10.

FN13 Applicants estimate that interest during construction will be approximately $40.7 million.

FN14 Applicants estimate that interest during construction will be approximately $6.5 million.

FN15 See Attachment 1.

FN16 Not only would the increase in revenue requirement be offset by the reduced costs associated with use of ANZCAN and satellite facilities and increased transiting revenues, but there is the real possibility that the introduction of fiber optic technology may stimulate traffic demand beyond current estimates.

FN17 The estimated original capital cost of a basic digital half-circuit (MAUO) in HAW-4/TPC-3 between the U.S. Mainland and Japan is $39,900 which is substantially lower than the original analog HAW-3/TPC-2 half-circuit cost of $127,600, despite 15 years of inflation from the service date of HAW-3/TPC-2 to the service date of HAW-4/TPC-3. In fact, HAW-3/TPC-2 will have a lower original cost than the depreciated net book cost of the earlier HAW-3/TCP-2 system, which is projected to be $59,910. The unit cost of a HAW-4/TPC-3 voice channel can also be reduced dramatically through the addition and use of DCMS. DCMS will derive nominally five virtual voice channels from each MAUO, compared to the 2:1 advantage gained from the application of Time Assignment Speech Interpolation (TASI) to a 3kHz analog circuit.

FN18 We expect that the foreign partners in the Pacific region will enter into operating arrangements with additional U.S. carriers and service providers.

ATTACHMENT 1

TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE

ATTACHMENT 2

TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE

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1986 WL 292522 (F.C.C.)

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