

CALIFORNIA INSTITUTE OF TECHNOLOGY
Laser Interferometer Gravitational Wave Observatory (LIGO) Project

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Subject: **RESPONSE TO MULTIPLE ACTION ITEMS IN PARSONS’
“REQUIREMENTS DEFINITION WORKSHEET”**

NOTE: This version (v-02) addresses only items 1) and 7) of the original memorandum. See change bars for modifications from v-01.

The following pages are the LIGO responses¹ to the following action items from Parsons’ “Requirements Definition Worksheet (RDW)”:

- 1) Communications between CDS and FCMS (Action Item No. 134)
- 7) Special Telephone Requirements (Action Item No. 141)

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1. As discussed in the 11 Sep 95 Integration and Systems Engineering meeting.

**Needed information on communications between CCDS and FMCS
Response to Action Item No. 134 of Parsons' "Requirements Definition Worksheet"**

[NOTE: Responses to AI 134 were modified 5 November 1995]

Action Item No. 134 of Parsons' "Requirements Definition Worksheet" states:
It is still unclear if any data are to be transferred between the CDS and the FMCS. An example is "state" information of major Facility equipment such as AHUs and chillers. If data transfer does occur then we need specifications to follow to ensure the compatibility of data.

[1] The systems which provide CDS and FMCS functions are separate entities and shall be accessed separately. LIGO has no requirement that FMCS subsystems (if such are needed) which control separate buildings be able to communicate with each other. Any monitoring system associated with the FMCS in the corner station shall be, as a minimum, co-located in the Control Room within the OSB. FMCS shall be limited to a single monitor (and its wiring) within the Control Room of the OSB. LIGO has no requirement regarding where FMCS monitors (if such are needed) are located in other buildings.

[2] The FMCS and its access within buildings of the LIGO facilities shall be defined and designed according to the standard practices for such systems. The OSB control room is the only place where LIGO requires access to both the CDS and FMCS to be co-located. In the event, per [1] above, that individual FMCS subsystems in separate buildings do not communicate with the corner station FMCS, then LIGO requires that each of the independent FMCS subsystems provide dry contacts capable of handling 48 VDC, 1A (i.e., two logical states OPEN and CLOSED) which indicates health status of all FMCS-controlled systems in the respective building: CLOSED shall indicate that all systems are functional and OPEN shall indicate that a problem, failure, or fault has been detected.

Needed information on telephone system
Response to Action Item No. 141 of Parsons' "Requirements Definition Worksheet"

[NOTE: Responses to AI 141 were modified 5 November 1995]

Action Item No. 141 of Parsons' "Requirements Definition Worksheet" states:
Need information on any special requirements for the telephone system.

The following design requirements hold:

- [1] As a minimum, the phone system shall provide functions including, but not limited to, conference calls, voice mail, and call forwarding.
- [2] Within buildings (LVEA/VEA/OSB) phone communications shall be by wire (FO or copper: i.e., no RF transmission) using either ANALOG or DIGITAL phone lines.
- [3] Inter-building communications links shall be provided as part of the Facilities construction contract and represent the minimum, cost-effective solution.
- [4] Intra-building communications shall be provided by the Facilities as follows:
Phones shall be provided according to standard practice in all OSB rooms and other spaces (lounges, kitchens, etc.).
Access from the phone line distribution panel in all buildings shall be made available. LIGO will arrange for installation of wire-based phone systems within the LVEA/VEAs.
Communications along the BTE shall be by means of wireless communications devices of TBD type. These shall also be provided separately by LIGO.