NSF Presentation -

Subcontracts for:

Seismic Isolation Air Bearings

Seismic Isolation Leg Elements

Core Optics Coating

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28 April 1998

Procurement Sensitive Document-

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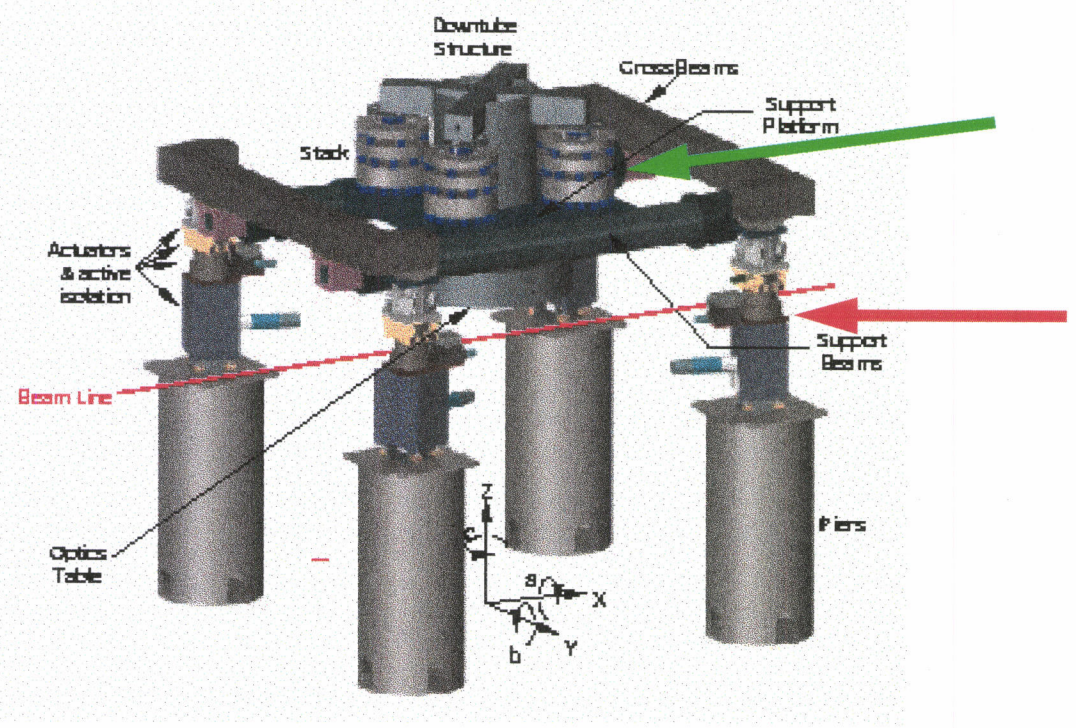
Seismic Isolation: Air Bearings/Leg Elements

- **Two types of seismic isolation stacks**
  - ››BSC Chambers (10 in WA, 5 in LA)
  - ››HAM Chambers (8 in WA, 4 in LA)
- **Leg elements inside vacuum system for seismic motion attenuation**
- **Air Bearings outside vacuum system lift seismic stack to allow motion**



Seismic Isolation Air Bearings: Procurement Plan

- **Significant technical challenges**
  - ››Limited number of suppliers; most are small companies
  - ››Only experienced manufacturers have knowledge for detailed design
  - ››Must continue with the First Article vendor for production units
- **Approach**
  - ››HYTEC to issue First Article fabrication contract (1 BSC, 4 HAM) with production option
  - ››LIGO to assume production contract
- **Extensive search led to 4 companies judges qualified on technical basis**

Seismic Isolation Air Bearings: Procurement History

- **Initial solicitation from Hytec asked for First Article pricing only**
  - ››LIGO recognized need for production costs
  - ››Wanted assurance that First Article vendor would be willing to continue with production phase
- **Modified solicitation to ask for pricing on production**
- **Most favorable proposal received from Specialty Components**
  - ››Fact-finding visit to company to ascertain capabilities and to verify understanding of technical requirements
  - ››Resulted in minor revision to quote to comply with LIGO materials and cleanliness requirements
- **First Article experience**
  - ››Prototype undergoing test (today!)

Seismic Isolation Air Bearings: Current Subcontract

- **Specialty Components (Connecticut) selected for award**
  - ››Specializes in air bearing design and manufacturing
  - ››Small business: approximately four employees
  - ››In business since 1975
- **Firm fixed price for production of 90 air bearings (2 spares)**
- **Low risk for company, based on First Article design/fabrication**
- **Production to begin in August, after completion of First Article test, but with long-lead material procurement starting now**

Seismic Isolation Leg Elements: Procurement Plan

- **Original plan (NSF - June 1997)**
  - ››HYTEC to issue First Article fabrication contract (1 BSC, 3 HAM) - Aug 97
  - ››LIGO to bid and award production contracts - Apr/May 98
- **Original plan assumed no special need to continue with the First Article vendor for production units**
  - ››Fabrication challenges minimal, as expected
  - ››However, cleaning development has proven to be more challenging than originally envisioned
- **Decision to award production phase to First Article vendor**
  - ››Incumbent had overwhelming cost advantage in First Article
  - ››Negotiated significant further cost reduction
  - ››Retain cleaning experience gained on first article

Seismic Isolation Leg Elements: Procurement History

- **Initial solicitation from Hytec to 6 firms asked for First Article pricing only**
  - ››Only two responses (Allied and PSI)
  - ››Due to developmental effort required for cleaning
  - ››PSI very much higher than Allied
- **Recognized need for ROM pricing on production and modified solicitation**
  - ››Allied clear winner for First Article leg elements
- **Separate solicitation issued for support tubes and optical tables at same time**
  - ››No direct linkage, but Allied also selected for this effort
- **Leg element First Article experience**
  - ››Excellent performance by Allied
  - ››No significant changes in design to indicate any benefit from resolicitation

Seismic Isolation Leg Elements: Production Order

- **Incorporate into current contract for support tubes and optical tables**
- **Firm Fixed Price on per unit basis**
- **Negotiated $150 k price reduction compared to ROM price submitted with First Article**
- **Adequacy of cleaning techniques and hardware demonstrated with First Article**
- **Combination with support tubes and optical tables maximizes effectiveness of LIGO contract supervision**
- **Want to authorize material procurement as soon as possible**

Core Optics Coating: Background

- **Research Electro-Optics (REO)**
  - ››Unique reputation for precision optical coatings for use in the research community
  - ››Long-standing commitment to development of optics for LIGO
  - ››Small company (Boulder Colorado), with steady growth rate and expanding business base
- **Pathfinder development program demonstrated coating uniformity**
  - ››Meets all LIGO requirements
  - ››Demonstrates effectiveness of tooling and handling techniques
- **Plan to begin coating by mid-May**
  - ››Gives time for testing of first LIGO optics before delivery to sites in early fall

Core Optics Coating: Proposed Change Order

- **Initial contract with REO for Pathfinder coating demonstration approved by NSF**
- **Production pricing based on coating chamber time used**
  - ››All optics coated on front and back surfaces
  - ››40 optics, 6 coating specifications
  - ››Most coating runs contain 2 optics
  - ››"Developmental" runs to tune coater for critical coatings
- **Special handling constraints**
  - ››Chamber dedicated to LIGO optics; no shared usage
  - ››All LIGO coatings to be directly supervised by Lalezari or Ness
  - ››Special cleaning and handling procedures
- **Firm fixed price addition to Pathfinder contract**

Summary

- **Seismic Isolation Air Bearings**
  - ››Competitive procurement for First Article and production
  - ››Excellent performance by Specialty Components on First Article
  - ››Need authorization to begin long-lead material procurements
- **Seismic Isolation Leg Elements**
  - ››First Article contract awarded to Allied through competition
  - ››Current price represents $150 k savings over ROM submitted with First Article proposal
  - ››Add-on to existing contract for support tubes and optical tables
- **Core Optics Coatings**
  - ››Follow-up to extremely successful Pathfinder development
  - ››Firm commitment from REO on delivery schedule
  - ››Need approval by early May to maintain schedule