

Silent Inspector Board of Directors Meeting Minutes
22-23 February 2007
Jury Hotel, Washington D.C.

1. The Silent Inspector (SI) Board of Directors (BoD) meeting was held on Thursday-Friday, 22-23 February, in Washington DC. The meeting agenda and a list of participants are provided as Enclosures 1 and 2.

2. Wynne Fuller, Chairman SI BoD, brought the meeting to order by welcoming participants to the first SI BoD meeting. Mr. Fuller stated that the purpose of the meeting was to address the issues surrounding the implementation of the SI technology and ensure we are getting the maximum benefit for our dredging mission. These issues include addressing the challenges to industry, since industry is a vital partner in the implementation of SI. Following the introduction of participants, Mr. Fuller distributed the SI BoD Charter (Enclosure 3). The philosophy behind the charter was to develop reasonableness and not a lot of regulation in how we approach implementation. The issue is not if there will be an SI Program in the Corps, but to determine how best to implement the SI program – as decided by MG Riley on 17 April 2006. The SI BoD is not necessarily a decision making board, but a board to make recommendations to the HQ Navigation Business Line Leader

3. Jim Walker, HQ Navigation Business Line Leader, spoke to the overall implementation of SI and thanked everyone for their efforts so far. The best way to solve the issues is not through Corps HQ, but through participants from the Corps Divisions, Districts, R&D, and industry. Mr. Walker was looking for recommendations to improve the SI implementation and evolve the technology to the most useful tool. He requested that the SI BoD review the SI Charter and provide comments. It is noted that the SI Charter was not distributed prior to the meeting; therefore the charter will be distributed through email to the SI BoD members for review and comment.

4. Mr. Fuller stated that the SI BoD membership was developed through HQ. An effort was made to have a diverse group with participation from the Regulatory and Operations communities, regional representation, and strong technical representation. The SI BoD will have at least one meeting annually, with two meetings per year until the program is up and running. Meeting information will be reported back to the SI BoD and the Director of Civil Works (DCW) in a timely manner.

5. SI – Evolution to National Deployment. Gary Howell, SI Center, reviewed the history of SI and the evolution of SI from R&D to the SI national center and nationwide SI implementation. Mr. Howell discussed the SI business plan, the SI Center, each member's responsibilities, and the funding formula. Mr. Howell discussed the issue regarding where we limit the requirement for SI on small scows and barges, non-navigation dredging, and the regulatory cost. Mr. Howell will coordinate with the SI BoD members to develop thresholds for scow monitoring.

6. Catherine Donohue, NAD, stated that NAD objects to the current 0.875% of contracted amount-funding formula and proposed using a volume based formula. Ms. Donohue distributed example calculations (Enclosure 4) based on a volume-based formula. There was much

discussion on possible other methodologies for funding the SI Center. An itemized budget for the SI Center will be distributed to the SI BoD, and a Product Delivery Team (PDT) will be formed to review the funding formula and possibly make recommendations to the SI BoD and Navigation Business Line Manager for an alternate approach. However, the Navigation Business Line Manager stated that for FY07 the current guidance of 0.875% of each contract, as directed by MG Riley, will be implemented.

7. Barry Holliday, Dredging Contractors of America (DCA), commented that with respect to the SI regulatory, environmental, and sustainability standpoint, for accountability, allocating pennies-per-cubic-yard would give an opportunity that we would not have from the 0.875 concept to apply a permit fee for those cubic yards that would be in the permit jobs. We could then apply the same charge per cubic yard cost (or permit fee) to permit jobs.

8. **Industry Coordination.** Mr. Holliday discussed industry coordination with SI. While Barry strongly believed in SI while he was with the Corps, industry has reservations with the SI implementation. There are 3 drivers moving the program forward: 1) the Corps having adequate and appropriate dredging data available in order to be accountable; 2) dredging regulations on rental contracts requires Corps inspector on dredge 24/7. This is not happening in the Corps due to cutbacks and limited resources; 3) we have created an obligation by using SI, to be accountable for sustainability and environmental issues. Now the regulatory and environmental agencies understand the technology is available and expect accountability. We need the SI technology for accountability, and it is critical to the future of dredging operations.

9. Challenges for the future are integrating SI technology with the human QA and integrating SI with tools for the users of the data. Management level analysis and synthesis are needed and an SI Toolbox is needed. The SI should be integrated into dredging specifications and used as a tool. The SI is not a static system and will evolve. This evolution needs to occur as a partnership between the Corps and industry.

10. **Data Release Policy.** Jim Walker discussed the industry concerns about the sensitivity of releasing proprietary data. Gary Howell outlined the current gentleman's agreement between ERDC, HQ, and industry, but proposes a data release policy be developed and adopted by the SI BoD in order to formalize the policy and address concerns of industry. Great Lakes representative expressed the industry concern that the data will become public, released to competitors, and used against projects. A PDT will be established to provide recommendations for an SI data release policy.

11. Angie Premo, SAD, raised the issue that we misrepresent ourselves with using terms like "real time" and "always on". It is not truly always on and real time, and this misleads agencies to expect that they can get real time data from a website. This will be addressed in the data release policy PDT.

12. Chris Godfrey, NAE, recommended a regulatory PDT be organized to address the SI program for Regulatory. Given the different circumstances around the country, the program is not one size fits all. The thresholds for permit actions need to be addressed and the PDT will be headed up by Kathy Trott, HQ, and will make recommendations to the SI BoD.

13. **Dredge Location Reporting.** Gary Howell reported that dredge location and automatically reporting data to the Dredging Information System are frequent requests from Districts. Industry feels that knowledge of dredge location affects their competitive situation in bidding for contracts. The question was raised whether dredge location needs to be reported whether the dredge is working a project or not. After discussion, it was decided that the SI positioning monitoring will be turned-on “Upon Notice to Proceed”, and this change will be written into the specifications and permit conditions.

14. **Pipeline SI deployment Schedule.** Jay Rosati, SI Center, outlined the SI pipeline deployment plan and schedule. Pipeline SI is being deployed under the DOER program. There was much discussion on the pipeline deployment. The consensus was before SI Pipeline is fully deployed, the SI Center is to test and evaluate beach, coastal, upland river, harbor, long line, and new work pipeline operations. Industry requested they be given advanced notice on pipeline deployment. Any further recommendations for implementation will be brought before the SI BoD. The following projects were identified for the pipeline Test and Evaluation:

- beach - Charleston
- coastal/ocean - Charleston
- upland/river - Oregon, Sand River
- harbor - possibly the Oregon (Portland Harbor)
- longline and new work – no projects identified

15. Sheryl Carrubba, NWP, suggested there would be less pushback from Districts on the SI Implementation if they better understood the value added by SI. It would be beneficial if the SI BoD and Center provide examples and publications of SI benefits, cost savings, and success stories to allow Districts and Divisions to gain a better understanding of the SI capabilities and how SI can assist them in their dredging mission. Sheryl also stated that although we may not understand all the benefits of collecting the data now, it maybe very useful in our future mission. The SI BoD and Center should make an effort to reach out to Districts unfamiliar with SI.

16. Rick Smith, Weeks Marine stated that a definition of a scow needs to be better defined as related to SI. Week’s has Hopper barges that do not leak, therefore do they need to have SI? Urges SI be implemented only on scows that have potential for leakage.

23 February, Friday

17. **SI Certifications.** Tim Welp, SI Center, reviewed the process for SI certifications. Dredges should be recertified once per year from the date of issue of certification, or after they have a major yard work. The SI Center will now issue the certifications. The question was raised whether District resident office personnel can be trained to perform certifications. This is an issue for the SI BoD; however, the SI team has held training classes with Districts on the dredge so QA inspectors can assist in performing certifications. Some dredges have more than one Ullage table on board the dredge; dredges should have one Ullage table on the dredge and the table submitted with the certification is the table the SI center uses. The SI guidance specifications currently require that a licensed marine surveyor or architect, independent of the contractor, certify the Ullage table.

18. Training Report. Jay Rosati reviewed the SI training schedule. The SI training is to teach Districts how to use the SI software. Rhonda Lenoir, SI Center, performs this SI training and she is working to coordinate training with the Districts. The SI center is developing a training video to review use of the SI data for turtle risk assessments. Based on feedback from Districts on the usefulness of this video, it may be expanded to train on other aspects of implementing SI (QAR certifications and inspections, setting up SI, etc).

19. Projects Monitored. Jay Rosati reviewed past and current projects implementing SI. While the SI raw process data is never changed, there was much discussion on the need for standardization and consistency among the Districts for SI reporting, and whether adequate data are being collected for environmental monitoring. A PDT will be developed to evaluate SI data collection standards to meet all District needs.

20. Financial Report. Eddie Culpepper, SI Center, discussed the financial status of the SI Center. Mr. Culpepper has not been successful in finding a means for pulling financial information from Districts. The SI Center has not been successful in obtaining funds from all Districts with hopper and scow contracts, and Mr. Culpepper's slides identify those Districts which have paid and those which have not (Enclosure 5). Mr. Fuller stated that in accordance with the Guidance Letter provided by the DCW, the current 0.875% funding mechanism will be implemented until further notice and until the PDT has time to make recommendations on alternate approaches and they are reviewed by the Navigation Business Line Manager and the SI BoD. At that time, recommendations will be brought to the DCW. Jim Walker requested that the SI Center develop a list of FY07 contracts and SI funds received against contracts. The information will be sent to District Operations Chiefs, and they will have the opportunity to provide funding prior to the SI In Progress Review (IPR) with MG Riley.

21. Government Dredge Implementation. Sheryl Carrubba discussed the status of government dredges equipped with SI. The Essayons is equipped for SI, the McFarland getting equipped with SI, Yaquina is getting DredgePak and has SI sensor installation as part of the repowering plan but needs PRIP funds, and the Wheeler is not equipped with SI. There has not been any definitive direction to install SI on all vessels. The means to fund sensor installation on government dredges is an issue. Barry Holliday referred to the SI Implementation Guidance Letter stating that all hopper dredges are required to be equipped with SI, therefore why are not government dredges included? HQ will require that all hopper dredges, including government dredges, will be equipped with SI. This will be a briefing point at the SI IPR with MG Riley.

22. Definition of Scow for Monitoring Purposes. Gary Howell discussed the need to define a Scow to determine the limit of SI implementation for small contracts. Should the SI requirement be defined by purpose or by type of plant? What ever is decided will have regulatory implications. Mr. Howell suggested the following rules:

If monitoring is required

If excavation is for navigation

There was discussion on the definition of scow thresholds. The SI BoD representatives are to provide their recommendations on scow thresholds to Gary Howell.

23. **Proposal for Mechanical Dredge Requirement.** Gary Howell stated that the SI specifications for mechanical dredges have been developed and contractors are already moving quickly on mechanical dredge monitoring for environmental purposes. The SI Center recommends that the Corps does not mandate SI Implementation on mechanical dredges; but if monitoring is required the SI specifications must be met. The SI specifications will be minimal initially, and expand based on needs identified through implementation. SI BoD members are to send comments on SI mechanical dredge requirements to Gary Howell.

24. **Guide Specification Modification Requests.** Jay Rosati discussed requests the SI Center has received for modifications to the SI specifications. Districts have requested the SI monitor the turtle deflector approach angle and the water temperature on the drag head or engine intake. Angie Premo will work with the QAR/turtle group to evaluate and make recommendations to the SI BoD. Data communications can be improved by allowing cellular technology in addition to satellite communications. Since the communications issue fall under the SI Center authority, they will work directly with industry and the government dredge representatives and report back to the SI BoD on status and decision.

25. **Action Items.** Wynne Fuller reviewed the meeting action items (summarized below).

26. The next SI BoD meeting will be held in conjunction with the mini-ICHDMG and National Dredging Team meetings to be held June 12-13, 2007 in Washington DC.

Silent Inspector Board of Directors Meeting Minutes
22-23 February 2007
Action Items

- 1) The SI BoD Charter will be emailed to Board for review with comments brought forward to HQ **by 14 March 2007**. Comments should be provided to Gary Howell by **7 March 2007** for consolidation.
POC: Gary Howell
- 2) Establish PDT to review SI funding strategies such as CY vs. contract cost and make recommendations to the SI BoD. The PDT will report on findings by **23 March 2007**. The 0.875% in the guidance letter from MG Riley remains in effect until further notice.
PDT: Catherine Donohue, KC Clark, Eddie Culpepper
- 3) Establish Regulatory PDT to coordinate with regulatory community to address regulatory issues (scow thresholds, implementation requirements, funding, etc). Develop scope of work and report back to board **by 23 March 2007**
PDT: Kathy Trott-HQ (lead), Chris Godfrey-NAD, Irene Sadowski-SAD, Linda Lillycrop-SI Center, Representative from West Coast
- 4) Revise SI specifications and permit conditions to state that SI will be turned on “upon notice to proceed”. Otherwise, dredge location reporting will follow current procedures (Don Pommer weekly report, contact contractor). SI Center to address and provide recommendation to SI BoD **by 27 April 2007**.
POC: Gary Howell
- 5) Report on SI success stories, SI benefits, and how SI has been implemented successfully. Report to SI BoD **at June 2007 meeting**. Enclosure 6 is an example of SI success stories provided by the Mobile District.
PDT: Angie Premo (lead), Carl Dyess, Gary Howell
- 6) Provide itemized SI Center budget to SI BoD **by 16 March 2007**.
POC: Eddie Culpepper
- 7) Date for next SI BoD meeting, June 12-13, 2007 in conjunction with mini-ICHDMG and National Dredging meeting in Washington DC.
- 8) Pipeline Implementation – Test and Evaluation demonstrations to collect and observe data on a number of project types prior to full pipeline implementation. Any further recommendations for implementation will be brought before the SI BOD as a result of the test and evaluation demonstrations.
POC: Carl Dyess, Gary Howell
- 9) Modify SI guide specification concerning Ullage table: The SI Center will send the contractor an SI Dredge Plant Instrumentation Plan (DPIP) approval cover sheet or stamped copy to be attached to the contractor’s copy of the submitted ullage table, which remains on-

board the dredge. This will ensure that the contractor's ullage table on-board the dredge and the ullage table submitted for SI certification is the same document. The SI guide specifications will be modified **by 23 March 2007**.

POC : SI Center - Jay Rosati

- 10) Establish PDT to develop SI data collection standards for different types of contracts, with an emphasis on consistency to ensure data accuracy. QA processes for accuracy. Standardize to capture data for all districts needs, customize to meet district specific needs. Emphasis on additional automated and human data collection. Report to SI BoD **at June 2007 meeting**. PDT: Carl Dyess (lead), Nate Lovelace, Tom Fredette, East Coast, West Coast, Southeast, and Environmental
- 11) Financial report to DCW. SI center develop list of FY07 contracts and SI funds received from Districts against contracts and provide to HQ **by 9 March 2007**. POC: Eddie Culpepper
- 12) HQ will notify/contact Districts (Navigation and Operations Chiefs) for opportunity to fund prior to bringing forward to DCW at SI IPR. POC: Jim Walker
- 13) HQ requires that all hopper dredges, including government dredges, be equipped for SI and implement SI. Develop schedule with hard milestones. Establish list of government plant POCs. Call to District POCs to identify status of hopper dredges equipped with SI. Develop strategy for getting hoppers on-board. Report back to SI BoD **by 30 March 2007**. POC: Sheryl Carrubba, identify PDT
- 14) Develop thresholds for scow monitoring. Definition of scow. Gary Howell provide written statement of potential thresholds to SI BoD Representatives and BoD provide recommendations to Gary by 7 March, information forwarded to HQ **by 16 March 2007**. POC: Gary Howell
- 15) Recommendations for SI implementation on mechanical dredges. Gary Howell provide written statement of implementation recommendations to SI BoD Representatives to obtain feedback from regional contacts. BoD provides comments to Gary Howell **by 23 March 2007**. Report recommendations back to SI BoD **at June 2007** meeting. POC: Gary Howell
- 16) Modifying SI guide specifications - Monitoring a) turtle deflector approach angle and b) water temperature at draghead. Obtain feedback from Hopper QAR COP and turtle group, Daniel Small, and Phil Bates. Report recommendations back to SI BoD **at June 2007** meeting. POCs: Angie Premo, Linda Lillycrop
- 17) Develop PDT to evaluate data communications technology updates. SI Center investigates District needs/limitations with all coasts and makes recommendations to SI BoD **at June 2007** meeting.

POC: Jay Rosati, ID PDT

18) Establish PDT to develop SI data release policy. Evaluate level of and availability of SI data to regulatory/environmental agencies and public access. Develop recommendations for data release and incorporate into appropriate ERs, write policy statement for SI data release.

Report to SI BoD **at June 2007 meeting**

PDT: Angie Premo (lead), Barry Holiday, Chris Godfrey, Linda Lillycrop

Silent Inspector Board of Directors Meeting
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Agenda

22 February, Thursday

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|------|---|---------------------------|
| 1300 | Welcome & Introductions | Mr. Fuller |
| 1315 | Role of the Board and members | Mr. Fuller |
| 1330 | Silent Inspector - Evolution to national deployment | Mr. Howell |
| | SI National Center | |
| | SI Funding formula | |
| 1430 | Break | |
| 1500 | Industry Coordination | Mr. Holliday & Mr. Howell |
| | Data release policy | Mr. Howell |
| | Dredge location reporting | Mr. Howell |
| | Pipeline SI deployment schedule | Mr. Rosati |
| 1630 | Discussion | Mr. Fuller |
| 1700 | Evening Break | |

23 February, Friday

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| 800 | Operations status report | Mr. Rosati |
| | Certifications | |
| | Projects Monitored | |
| | Training Report | |
| | Financial Report | Mr. Culpepper |
| 845 | Government Dredge Implementations | Ms. Carrubba |
| 900 | Definition of a Scow for monitoring purposes | Mr. Howell |
| 930 | Proposal for Mechanical Dredge requirement | Mr. Howell |
| 1000 | Guide Spec modification requests – technical committees | Mr. Rosati |
| 1030 | Break | |
| 1100 | Discussion | Mr. Fuller |
| 1130 | Action Items and Report to DCW | Mr. Fuller |
| 1200 | Adjourn | |

**Silent Inspector Board of Directors Meeting
Participants**

22-23 February 2007

Jury Hotel, Washington DC

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Charter for the Silent Inspector Board of Directors

Mission

a. Scope. The Board of Directors (BoD) shall represent the interests of the U.S. Army Corps of Engineers (Corps) in the administration of the public-private partnership for automated dredge monitoring known as the Silent Inspector (SI). The BoD shall formulate policy recommendations to the Navigation CoP team leader that guide SI implementation by Major Subordinate Commands (MSCs) and the National Support Team in the Mobile District. This includes the implementation schedule of mandated dredge monitoring, certification of dredge plant, requirements for government owned dredges, access rights to dredging data, implementation of SI in regulatory permits, and the mechanism for funding the costs of the national support team.

b. National Support Team. The BoD shall provide guidance, oversight, and accountability of the SI National Support Team. The BoD will receive feedback from the field users of the SI, raise performance problems and recommend resolution. The BoD will review accounting of income and expenditures of the National Support Team.

c. Engineer Regulations. The BoD shall review SI related updates to Engineer Regulations and Pamphlets, arbitrate conflicts over national standardized specifications that cannot be resolved by staff, and arbitrate issues raised by industry that cannot be resolved by staff.

d. R&D. The BoD will recommend and prioritize research and development problems related to SI implementation or the application of monitored data to field problems.

e. Silent Inspector Points of Contact (POCs). Routine guidance and coordination of Silent Inspector operation is the responsibility of POCs in districts and divisions. POCs will be experienced Operations dredging project managers or technical support experts selected by their organization. They will resolve day-to-day issues, provide feedback on problems, coordinate training, and establish local policies for use of SI. They will provide input to the BoD on policy and national issues.

Membership

a. Selection. Members of the BoD shall be selected by the Corps Headquarters Navigation Business Leader and appointed by the Chief of Operations. The objective is to represent regional, technical, and business interests of the Corps dredging community. The Chief of Operations, Mobile District, is responsible for the management of the national SI implementation and will serve as Chairman of the BoD. Ex-Officio membership will be available to non-Corps partners. The Dredging Contractors of America (DCA) will be asked to nominate an ex-officio member.

b. Regional. Regional representation will be achieved with one member from each MSC. Regional MSCs may share a member, for example the member from North West Division may also represent Pacific Ocean Division.

c. Functional. In addition to regional representation, the BoD requires members that can represent the diverse business and technical dredging functions. Senior District experts with the ability to represent multiple business and technical functions will be sought.

d. Technical. Technical representation is required for dredging technology including plant operations, specifications, inspection, payment measurement, and claims evaluation. Technical requirements for environmental issues include disposal area monitoring, threatened and endangered species, and overdepth.

e. Business. Business line representation is required for dredge management issues such as scheduling, cost estimation, and bid strategy. Contract management issues include Quality Assurance, routine reporting, and environmental compliance. Regulatory issues include permit conditions and permit compliance monitoring.

f. R&D. A member from Research and Development will inform the BoD of technical advances that may improve the operation or use of SI. The R&D member will be tasked with informing the R&D programs of requirements for additional research as required to advance SI or aid the use of the measured data to meet the Corps business and sustainability goals.

g. Tenure. Membership will be staggered with 2 year terms.

Meetings

a. Schedule. The BoD shall convene annually, as a minimum. The Chairman may convene the BoD for special meetings as required. The Chairman will attempt to coordinate meetings with other dredge team meetings to minimize travel and time requirements. The chairman may employ email, teleconference, or video conference to conduct BoD business.

b. Actions. The Chairman shall report actions and recommendations of the BoD to the headquarters Navigation Business Leader.

c. Minutes. The Chairman shall report minutes of meetings to the BoD.

NAD DRAFT SI Financial Management Plan

GOAL: Derive a simple payment method to support SI Center

Assumptions:

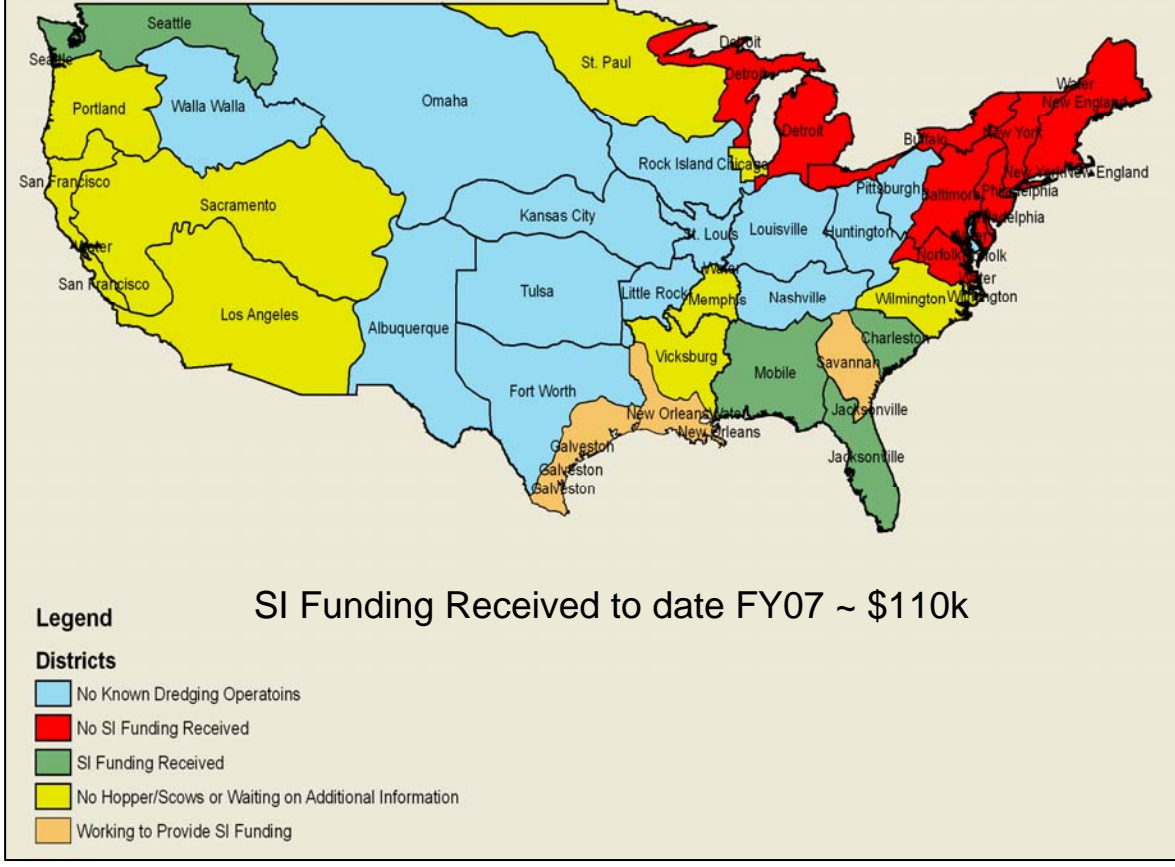
- The SI Technical Center requires an annual budget of \$1,575,000 to operate
- The amount of dredging varies per year per division per district
- Unit price contracts bear the cost of before and after dredge survey and /or beach profile survey for payment while other dredging contracts rely on SI data for payment
- In order to derive funding per project we used the following methodology:

The Silent Inspector Technical Center has an annual need of \$1,575,000 to operate. The actual cubic yards dredged by hopper dredge in each division was resourced from OMBIL for FY2004 – FY2006. Starting the derivation by assuming each Division will support the Center evenly by contributing approximately \$196,875. The chart shown below outlines the Division's share to support the SI Tech Center divided by the Division's total CY dredged by Hopper. This calculation generates a per CY dredged cost. The average of each Division's cost was taken over a three year period in order to normalize the national cost proposed of \$0.038/ CY.

Division	Division Share for SI support	Total FY06 Hopper Dredge CY	FY06 cost for SI support/ CY dredged	Total FY05 Hopper Dredge CY	FY05 cost for SI support/ CY dredged	Total FY04 Hopper Dredge CY	FY04 cost for SI support/ CY dredged
1 LRD	\$196,875.00	No data reported	0	No data reported	0	No data reported	0
2 SWD	\$196,875.00	No data reported	0	11,193,985.00	0.01758757	1,726,186.00	0.11405202
3 SPD	\$196,875.00	3,278,704.00	0.060046592	3,278,704.00	0.060046592	2,003,525.00	0.098264309
4 SAD	\$196,875.00	7,741,501.00	0.025431115	15,694,992.00	0.01254381	15,407,863.00	0.012777567
5 NWD	\$196,875.00	7,297,730.00	0.026977567	9,180,468.00	0.021444985	9,170,573.00	0.021468124
6 NAD	\$196,875.00	3,426,226.00	0.057461183	5,566,499.00	0.035367832	2,968,397.00	0.066323676
7 MVD	\$196,875.00	23,917,226.00	0.008231515	23,783,671.00	0.008277738	27,043,908.00	0.007279828
8 POD	\$196,875.00	No data reported	0	No data reported	0	860,000.00	0
Total SI Center Need:	\$1,575,000.00	45,661,387.00	0.035629594	68,698,319.00	0.025878088	59,180,452.00	0.053360921
		FY06 Average cost for SI participation	\$0.036 / CY	FY05 Average cost for SI participation	\$0.026 / CY	FY04 Average cost for SI participation	\$0.053 / CY

Three year average cost per CY for SI participation is \$0.038/CY

Silent Inspector FY07 Funding Status, February 2007



Silent Inspector Successes
Mobile District
14 Mar 07

1. Worn Impeller. The Stuyvesant was under contract for rental dredging of Mobile Bay. A review of the SI plots showing production showed irregularities in the pump output. On further investigation it was determined that the impeller was worn out and should have been changed. Though this was not discovered until after the completion of the contract, it was a learning experience for the project engineer/inspectors and after viewing the plots, they now have a better understanding of what to look for and should be able to identify this problem on future contracts.

2. Dredge Leaking. SI plots of the Stuyvesant (different contract from above) showed decreasing draft as the dredge was sailing to the dump site. Upon further investigation it showed the dredge was severely leaking material back into the channel. The inspectors on the dredge did not notice any appreciable change in the hopper volume. Indications were that the contractor was pumping water into the hopper to offset the loss of volume; however the draft sensors showed the load was getting lighter as the dredge sailed. This occurred near the end of a contract and consequently, the contract was terminated a few days early due to the short duration of time remaining and the long down time anticipated to make repairs. As a result of this experience, Mobile District modified future contract specifications to require no more than a 5% leakage of water in a one hour period; tests are required prior to initiation of work to verify the dredges ability to hold water. 5% or less leaking of water is allowed assuming that thicker nature of a sediment load will plug any minor leaks.

3. Cost savings. Prior to SI, rental contracts were inspected 24 hours per day, using SI allows only 8 hour inspection. This results in an annual savings of approximately \$250K. With the cost of the SI system totaling 0.875% of contract cost, this amount equates to approximately \$100K per year for Mobile Bay rentals. The resulting cost savings is \$150K annually.

4. Dredge Assignment Determination. Project Engineers, after becoming familiar with the SI system, learn when to move a dredge from a given assignment due to decreasing production. This determination can be made without waiting on surveys to show whether or not the assignment has been cleared resulting in more efficient dredge utilization by keeping the dredge working in the most heavily shoaled sections of the channel.

5. Accurate Dump locations. Project Engineers learn to quickly determine if the dredge is dumping in the correct location simply by viewing the coordinates at the time of dump.

6. Draghead/Pump Status. Project inspectors can determine the status of the pumps and dragheads to meet turtle requirements (not running the pumps while draghead is raised). This is most critical during turning in the channel as the dredge raises the draghead to turn.

7. Hopper Door Status. Inspectors can determine if the hopper/doors were closed after the dredge leaves the disposal area.

8. Unusable Volume. SI was used to determine the average carrying volume of water/material after the load is dumped. This resulted in revised hopper volumes in the rental hopper charts and has encouraged contractors to make dredge modifications to decrease this volume as it now affects their respective positions at the bid table.