ORD Operational Accomplishments

Achieving Efficiencies and Reinvesting in the Science through Improving ORD's Business Operations

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Introduction

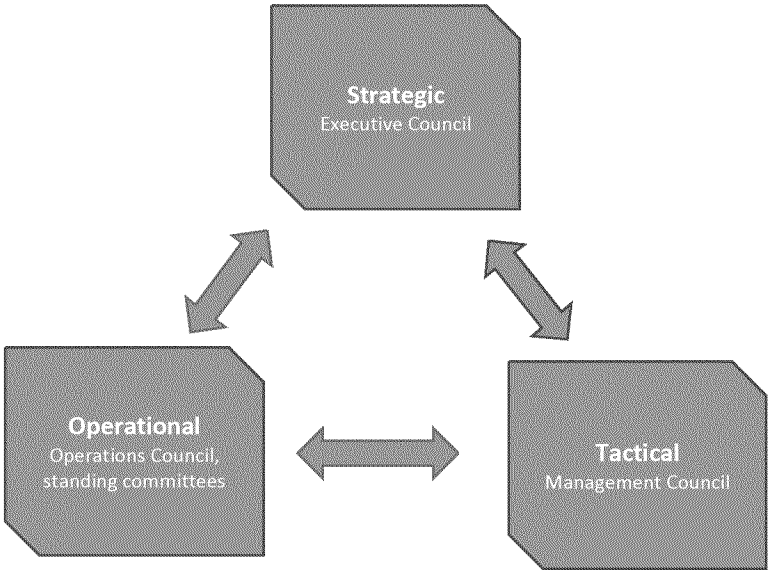
In a resource constrained environment, the Office of Research and Development (ORD) is focused on maximizing the reach of every dollar by increasing efficiency, reducing unnecessary costs, and optimizing performance. ORD's system of governance, comprised of the Executive Council, Management Council, and Operations Council, has been developed and enhanced over the years providing ongoing assessments of the current environment, determining where the organization should go, and the best approaches to get there. This management approach has served ORD well by optimizing the organization to support the scientific and assessment needs of the agency. The structure involves strong leadership over strategic, tactical, and operational areas requiring seamless and effective communication and coordination to carry out changes and improvements to the organization.

ORD is a multifaceted organization comprised of over 1,700 federal and 750 non-federal employees, including student services contractors, post-doctoral trainees, and fellows, and is the agency's largest and most geographically dispersed organization with 13 locations positioned throughout the U.S. Since Fiscal Year 2006, ORD's total budget has decreased by 14% from $595M to $512M. ORD'S workforce has been reduced by almost 15%, or 290 full time employees. In spite of these reductions, ORD continues to be the nation's premiere environmental research organization whose leading-edge research provides the solid underpinning of science and technology for EPA's Program and Regional Offices as they implement multi-media environmental policies, including regulatory control programs.

In 2006, ORD began a concerted effort to identify administrative and operational efficiencies that would ensure that ORD could maintain the necessary support for its science and research programs. The ORD Management Council (MC), a forum of ORD's Lab, Centers, Office, and National Research Program Deputy Directors, has led the effort to identify and implement cost saving refinements of administrative processes and opportunities to enhance and strengthen ORD's workforce.

This report provides an overview of some of the major efficiencies that have been achieved. Some are quantifiable and have resulted in millions of dollars being reinvested into the science portfolio. Others reflect substantial time savings that have freed up valuable hours to devote to the research and the science. Still others are more qualitative in their impact but have nonetheless allowed ORD to continue to provide the research and the science that support our mission of providing a safe environment for our nation's people. Taken together these accomplishments reflect an organization that is responsive to both internal and external demands and that continues to invest in its science and its science support.

Improving ORD's System of Governance



1. **Strategic**

The ORD Executive Council (EC) facilitates a strong, well-managed, effective, and respected national environmental science and technical organization. The EC operates as an enterprise-wide Board of Directors to provide strategic direction and oversight of ORD's scientific mission, and has enabled ORD to navigate the constantly changing demands on a state of the art science enterprise. Among its many functions, the EC serves as the recommending body for ORD-wide planning, program, and management decisions, acts as a forum to coordinate policy and resource issues across ORD, provides corporate organizational guidance regarding strategic research planning, resource allocation, scientific initiatives, and workforce requirements, and provides recommendations on effective human capital management and organization development.

Over the past decade the EC has charted a path forward for ORD that has enabled an organizational transformation that has facilitated ORD's evolution into a results driven, relevant and timely science and research organization. Under the strategic leadership of the EC, ORD has built capacity to integrate the environment and public health and to ensure that EPA's program offices have the science support that is essential to support EPA's regulatory programs. At the same time, the EC has ensured that ORD maintains a national and international leadership role in developing the tools and research programs necessary to address emerging human health and environmental challenges. The ongoing work of the EC will continue to ensure that ORD addresses todays science needs while anticipating tomorrow's challenges.

2. **Tactical**

At the tactical level, the ORD Management Council (MC) serves to ensure that there are consistent policies and procedures in place that support the work of ORD. By defining, developing, and implementing effective ORD management policies, procedures, and systems, the MC works to ensure that ORD is the number one provider of innovative, catalytic, and transdisciplinary science to support the Agency's mission. The MC serves as a forum for

management and research support issues, participates in the review and implementation of ORD-wide policies and procedures, conducts evaluations and promotes initiatives to improve management and research support functions across ORD, and provides recommendations to the Executive Council on management and resources issues.

3. Operational

At the operational level, the ORD Operations Council (OC), is charged with conducting in-depth monitoring of resource utilization from a corporate perspective, identifying and diagnosing issues, and recommending potential responses and solutions to the MC to help remedy issues. The OC is comprised of the Program Operations Directors from the Labs, Centers, and Offices, with on representing the National Research Programs.

Previously, ORD's financial management was overseen largely at the lab and center level. The MC identified the need to have a more corporate approach to resource management. The RAWG developed and communicated an improved understanding of financial management enterprise wide. In depth analyses of spending rates, carryover funds and payroll needs provided ORD senior leadership with a high level view of areas of inefficiency and allowed for a corporate response to address the issues. At mid-year FY 2016 the RAWG provided a comprehensive overview of spend rates, issues associated with slow commitment and obligation rates and recommendations for mitigating any potential vulnerabilities. As a result of these efforts, available year-end balances decreased from $93 million in FY 2015 to $25 million in FY 2016 – a 73% reduction.

Improving ORD's Business Practices

1. Project Planning Approach for ORD's Research Action Plans

After considerable discussion and planning with the ORD research community including the staff that provide essential administrative support to the research program, a common project planning approach was developed and implemented. This new approach (to include the improved changes to RMS) allows the ORD research community to be more effective.

Project planning in ORD has resulted in reduced organizational transaction costs. There is greater consistency regarding employee and financial resource allocation and utilization. This resource data is now readily available and reduces time and resources necessary to retrieve and analyze data.

The many advantages of this new approach include:

- Consistent project charter and task-level templates for all ORD project teams
- Identification of dependencies and resource requirements needed to deliver research products
- Allows for early engagement to identify and plan for administrative, IT, and workforce needs.
- Improved communication and coordination across ORD and reduced transaction costs
- Integration of Transdisciplinary activities that cut across the Laboratories and Centers.

2. Quality Management Plan and Quality Assurance Policies

Before establishment of integrated research under the ORD Matrix, individual research labs and centers developed individualized quality management plans, policies and procedures. Integrated research involving staff from multiple labs and centers required consistent quality management.

ORD led the development of the first, ORD-wide, quality management plan (QMP), approved by the Agency in 2012. Subsequently, OSIM led integration and alignment of individual lab and center QMPs with the ORD QMP; with expected completion in FY 2017. OSIM led the development and issuance of detailed quality assurance policies and procedures that are included in the ORD Policy and Procedure Manual, Chapter 13: Quality Assurance.

The plan and policies ensure consistent and rigorous approach to assure the quality of research across ORD. This leads to reduced risk, improved audit performance, and therefore reduces time required by staff and management to respond to inquiries on the quality of ORD research.

3. Simplified Acquisition Contracting Officer (SACO) Safety Net Pilot

The SACO Safety Net pilot was a significant accomplishment for OARS and for ORD. OARS, at the request of the MC, initiated a pilot program that allowed a mechanism for the broader ORD community to receive enhanced support from ORD's SACOs. This pilot was implemented because Labs, Centers, and Offices were experiencing difficulty getting their procurement needs met in a timely way. The pilot allowed expanded support within existing resource constraints and within current SACO warrant authority. The OARS pilot has been a great success, demonstrating consistent quality, excellent timeliness and high levels of customer satisfaction. SACO award timeframes have continued to be significantly faster than Agency Procurement Action Lead Times (PALTs). Effectiveness has been confirmed. Both customer testimonials and EAS customer survey results demonstrate a high level of satisfaction. Quality has been sustained. OAM review of SACO activities has resulted in commendations regarding the good state of simplified acquisition processes in EMD and management's commitment to continuous improvement.

In FY 2015, ORD's Simplified Acquisition Contracting Officers (SACO) processed in excess of 600

transactions on behalf of ORD, representing obligations of $2,775,995. Not only did this improve the timeliness with which ORD researchers received needed supplies and services, but it also relieved the Office of Acquisition Management (OAM) of the responsibility to process these lower risk but essential transactions, freeing up resources to prosecute larger, more complex procurements. In FY 2016, ORD initiated its "safety net" pilot, offering enhanced support to the broader ORD community within its existing SACO resource constraints. Under this pilot, and through the application of sound contracting techniques, SACO obligations increased to $2,927,566 and 46 safety net requests were successfully processed, while the total number of transactions was driven down to 576. The safety net provided support for ORD and agency priorities such as tire crumb research and also avoided mission delays during the fourth quarter of 2016, when OAM was overwhelmed by a combination of peak demand and staffing shortages. All this was accomplished while maintaining exemplary results in the quality and timeliness of work products and outstanding customer satisfaction levels. Average actual procurement acquisition lead times (PALT) were significantly less than the agency PALT standards. OAM external reviews of SACO activities in 2016 resulted in the commendation of senior management and the acquisition team for its commitment to correct vulnerabilities, and to find new improvements to elevate the performance of the organization, as well as the overall good state of the simplified acquisition process within the Extramural Management Division. Likewise, overall customer satisfaction ratings for FY 2016 were 4.94 (on a scale of 1 to 5, with 5 being the highest rating).

Based upon the demonstrated successes in 2016, the pilot has been significantly expanded for FY 2017. Two additional SACO FTEs were hired, giving OARS improved bandwidth to support the needs of the entire organization. The expansion plan increases the simplified processing capacity by approximately 200 procurements and will be effective for 2017 or until agreement is reached with OAM on a longer-term expansion plan. Results will be reviewed after 2017 concludes to determine whether adjustments to the program are warranted.

4. Enabling Purchase Card Use to Procure Journal Articles

Facilitating the use of purchase cards to obtain journal articles is an efficiency accomplishment for the Office of Acquisition Management (OAM) and ORD. Based on analysis performed by ORD, OAM updated their purchase card policy in FY 2016 with a significant change that allows for the use of purchase cards for journal articles. The updated policy makes it easier and more efficient for ORD scientists to get their important work out in the public eye in a timelier fashion, but also eases the transactional burden on the OAM contracting staff, allowing them to focus on larger ORD procurements.

The use of purchase cards for the procurement of journal articles avoids costs associated with entry of requisitions into the EPA acquisition system, processing by a contracting officer and recordation of the obligation into the agency's financial system. This change improves the timeliness by which EPA research results can be delivered to the public.

5. Freedom of Information Act (FOIA) Requests

During 2012 and 2013, ORD faced significant challenges as a result of increasing FOIA requests and inefficiencies in assigning and responding to them in a timely fashion. This resulted in inaccurate responses being provided to requesters and a large backlog of open FOIA cases. ORD responded by enhancing, streamlining and expanding its existing FOIA policies, operating procedures, and workforce. In 2015, ORD conducted a robust FOIA records retirement of FY 2014 cases, participated in Agency monthly FOIA coordinators meetings, updated ORD's FOIA policy in March 2015, and provided monthly FOIA case monitoring reports to ORD's senior.

Implementing these improvements resulted in a major milestone in improving ORD's FOIA responsiveness. Within a two-year period, the backlog of open cases was reduced from over 400 to

less than ten. In addition, older open cases, some going back as far as 2006, were closed. This virtually eliminated all of ORD's cases through 2014, greatly reducing ORD's vulnerability to future FOIA litigation.

6. Conference Spending Oversight

Starting in 2012, conference spending was increasingly scrutinized by Congress across the Federal government due to mismanagement of funds by various agencies. Congress put in place new reporting requirements for conferences and established dollar thresholds for approval, and OMB placed new oversight requirements on conference spending. ORD immediately developed easy-to-understand procedures to clarify the requirements. ORD also developed a user-friendly conference spending SharePoint site as a central information repository which provides transparency on the entire conference spending oversight process such as approval status and fillable templates to streamline the process of collecting supporting documentation as well developing customizable reports. As a result, many of ORD's processes and oversight were recognized by OCFO as a good standard approach across EPA.

A number of changes were implemented by ORD. These included: 1) Strengthened communications between ORD offices and the POCs; 2) Development of a communication action plan to assist ORD's financial and administrative staff; Development of tracking and status reports; and 3) provided early submission of the 5170 forms for Agency approval. Collectively, these changes resulted in significant savings by reducing managerial and administrative staff workloads, each year, due to the streamlined development, review and approval process ORD implemented.

7. Enhancing ORD's Communication of its Research Portfolio through the Research Management System (RMS)

In FY 2012, ORD implemented its new matrix management structure and research portfolio planning process. This included the creation of six new Strategic Research Action Plans (StRAPs). As part of that effort, ORD committed to enhancing its capability and transparency in quantifying and tracking ORD's work products to better communicate the impact of its research. One element of this effort was ORD's development of the Research Management System (RMS), a tool to improve communication of ORD's research portfolio.

Since 2012, ORD has made significant strides toward evolving and improving both the process of quantifying and tracking research as well as the RMS tool. Recognizing the complex factors influencing the annual performance information management cycle, in FY 2015 ORD reviewed RMS and its data and identified the need for action to be taken to address the challenges described above. ORD held meetings with senior management to discuss and address these issues, and implemented the following actions:

1. Reconstituted its RMS Working Group- with representation from both sides of the management matrix as well as OSIM and OPARM- to improve communication on organizational roles and responsibilities for performance and data updates within RMS, and strengthen the RMS SOPs to clarify areas of confusion about user access, timing of access in the budget cycle, and responsibility for data updates
2. solicited ORD L/C/Os and National Programs to validate the FY 2015 data in RMS and ensure the FY 2016 data was entered in a timely and efficient manner Reconstituted its RMS Working Group- with representation from both sides of the management matrix as well as OSIM and OPARM- to improve communication on organizational roles and responsibilities for performance and data updates within RMS, and strengthen the RMS SOPs to clarify areas of confusion about user access, timing of access in the budget cycle, and responsibility for data updates
3. solicited ORD L/C/Os and National Programs to validate the FY 2015 data in RMS and

ensure the FY 2016 data was entered in a timely and efficient manner

4. Made system enhancements, including improvements to reporting capabilities

In the near future, as part of a larger effort to integrate ORD's research support systems and improve the user experience, ORD will hold outreach sessions with targeted user communities, both internal and external to ORD, to solicit feedback and dialogue. This builds on the RMS changes that were implemented in April to remove unused or outdated fields, combine and renamed redundant fields, and add one new field to improve information consistency and business process efficiency across the research portfolio. These changes followed ORD Management Council engagement with some of our L/C/O and NPD RMS experts to review and approve changes to the RMS information requirements and business practices and clarify roles and responsibilities as they relate to RMS

As a result of the ongoing work in this area, ORD has clearer, improved RMS businesses processes that more clearly define roles and responsibilities. ORD now has more efficient data collection processes in RMS that have resulted in reduced staff time -- unused or outdated fields were removed and redundant fields combined to improve information consistency and business process efficiency across the research portfolio.

This effort has also resulted in improved reporting functionality that enables RMS users to access and interact with data more meaningfully and more efficiently

Creating Efficiencies

1. Science and Technological Achievement Awards (STAA)

The EPA's Science and Technological Achievement Awards (STAA) program promotes and recognizes scientific and technological achievement by EPA employees. STAA is among the most prestigious of EPA's scientific awards programs.

The STAA process was historically labor and paper intensive, with nominations having to be printed, scanned, and faxed, then reprinted multiple times for the awards panel. With an average of 120 nominations received every year, the total time required to administer the process from creating nominations to making selections was extensive. Awards were commonly bestowed on recipients well after the recognized effort concluded.

The STAA process underwent a Lean process in early 2015. The goals were to reduce the process steps from 94 to 36, process timing from 21 to 6 months, and reduce the error rate for applications to less than 1%. Implementation of the Leaned process was initiated in early 2016 and with that cycle about 60% complete, the savings so far are a reduction in time by 35% and process steps by 18%. Award applications are now entered into a database application. Total savings will be determined after the awards are processed.

2. The National Student Services Contract Program (NSSC)

With 13 locations across the United States, ORD had a need to establish a single contract vehicle to provide management of its Student Services Program. Prior to the establishment of the NSSC, there were 231 separate purchase orders to individual students for hands on educational experience in their related fields of study. The individual procurement of these services placed significant administrative burden on both ORD and the Office of Acquisition Management, and there were lengthy delays in the award of orders and onboarding of student contractors. The NSSC consolidated the recruitment, selection and personnel selection under one contract providing flexibility, leaning of administration, and streamlined processing and onboarding timelines. The consolidate contract was awarded on November 20, 2015.

The effort received the Agency 2016 Contract Management Award based upon generation of meaningful savings in personnel resources and significantly faster, streamlined onboarding of student contractors. Procurement timelines for student contractors under the NSSC reduced from approximately 8 months to less than 3 months. Saved an estimated $150,000 in the first year from funds that expired and were lost under previous stand-alone student procurements. Reduced administrative burden across ORD, OAM and OCFO by an estimated four FTE and $200,000 via reduction of number of contractual vehicles being managed and invoices requiring processing.

3. ORD Contract Consolidation Effort

ORD's corporate contractual vehicles were centralized within the Office of Administrative and Research Support (OARS) in FY 2012. Once consolidated, the OARS Extramural Management Division put forth initiatives to optimize ORD's contract vehicles, including the replacement or elimination of duplicative or underperforming contracts. OARS provided key support to agency strategic sourcing efforts, notably the laboratory supply strategic sourcing BPAs.

Savings from the consolidation effort are in administrative effort. For every reduction in contract, there is a reduction in contract transactions. Likewise, reduction to the total number of contracts reduces the number of invoices to be processed, contractor performance evaluations to be performed, among others. Specific consolidation efforts include:

- Replacement of four on-site laboratory support contracts in Cincinnati and Research Triangle Park with two contracts (one per site) of sufficient capacity to support all ORD RTP and Cincinnati

users.

- Transition of Software Engineering and Specialized Scientific Support (SES3) efforts to the National Institutes of Health Government-Wide Acquisition Contract (GWAC).
- Centralization of off-site research support into competitive contracts, allowing several smaller non-competitive contracts to expire.
- Centralization of conference support into one corporately managed contract with a woman-owned small business, allowing for consistency and improvement of ORD's socio-economic goals.
- Lab strategic sourcing BPAs allow the procurement of lab supplies (volume of $468k in FY 2016) in seven different commodity areas under three strategic sourcing vehicles with small businesses.

4. EPA Scientific Vocabulary

Scientific terms evolve and accrue over time. A tool was needed to track associations and changes in these terms, and to increase functionality and effectiveness of search engines using these terms. In order to ensure consistency and reliability for the research community, ORD developed the EPA Scientific Vocabulary. This compendium is composed of approximately 15,000 scientific and technical terms spanning EPA research areas and includes definitions, provenance, and relationships. It was deployed agency-wide as the underpinning for the Scientific Spell Checker, an add-in for Microsoft Word and other Microsoft applications.

The tool increases the functionality of these products to check accuracy of scientific vocabulary. At least 1 hour per product (e.g., scientific report, journal article, etc.) is saved by using this tool. If we assume the average ORD employee (at $50.00 per hour) uses the tool on each of ORDs 2,500 products in one year, $125,000 per year in increased productivity will be realized.

5. Laboratory Utilization Study

In March 2015, EPA published its Synthesis Report of the US EPA Laboratory Evaluation to describe actions EPA is taking to strengthen the effectiveness and efficiency of the agency's lab enterprise. The report indicated that there is potential to save money if EPA maximizes the use of owned lab spaces. The report also identified several facility consolidations that EPA is undertaking now, and others for further evaluation. As funds from the EPA building and facility (B&F) appropriation become available to implement these facility consolidations, the result will be improved efficiency for the agency's lab facilities. Following the publication of EPA Synthesis Report, ORD collaborated with partners in OARM, OCFO, and Region 3 to prepare an analysis that illustrates the need for EPA to accelerate investments in physical infrastructure to improve the overall condition of the agency's portfolio of lab facilities.

Actions currently underway include:

- Reproductive Toxicology Facility (RTF) – Consolidated activities from the RTF to the nearby Research Triangle Park, NC main campus. To accommodate the consolidation, an office building was constructed on the RTP campus and modifications were made to 116 laboratory modules. The 2015 move out of the RTF saves approximately $1.7 million annually in lease costs and $1 million annually in utilities, security, and operating costs.
- Athens, GA – Work is currently underway to begin to consolidate Region 4 administrative and research personnel from leased space into EPA owned space currently supporting ORD-NERL research.
- Las Vegas, NV – ORD-NERL will relocate lab personnel from the University of Las Vegas campus to RTP and Cincinnati. This will allow the EPA to cease our lease with Las Vegas.

Workforce Initiatives

1. ORD Workforce Enhancement Project (OWEP)

In FY 2014, the Acting Assistant Administrator of ORD requested that a team be formed to develop a strategic plan to focus on ORD's workforce. The effort was called the ORD Workforce Enhancement Project (OWEP). The charge to the OWEP working group was to (1) identify opportunities to enable ORD to optimize its workforce, reflecting the balanced matrix and (2) support the STPC Workforce Planning subcommittee. The Management Council was then charged with developing an implementation plan for the draft ORD Workforce Enhancement Project (OWEP). In support of ORD's strategic priorities for supporting and enhancing its scientific and administrative workforce, this implementation plan identifies the strategies and the programs needed to close the identified skills gaps in ORD's workforce as well as to ensure a nimble workforce prepared to respond to unforeseeable vulnerabilities, challenges, and opportunities. In addition, the plan identifies specific policies and procedures needed to implement the strategy, and metrics for assessing progress and making any necessary mid- course adjustments. This implementation plan attempts to address all the opportunities and all of the challenges in each of the six areas identified.

OWEP's accomplishments included the development of a consistent, comprehensive list of workforce disciplines for both the scientific and non-research staff; an assessment of ORD's scientific skills supply, demand, and gap; an assessment of workforce vulnerabilities; an assessment of ORD's non-research workforce, and the development of an ORD Workforce Strategy.

A new Workforce Advisory Board (WAB) has been formed to lead the implementation under the guidance of the MC. The WAB has been charged with:

1) Advising ORD leaders on human capital strategies, policies and workforce planning.
2) Assessing workforce characteristics and future needs and align the ORD's human resources policies and programs with the agency's and ORD's mission, strategic goals, and performance objective.
3) Advising and assisting ORD leaders in carrying out their responsibilities for selecting, developing, training, and managing a high-quality, productive workforce.

The MC oversees the implementation of the short term recommendations in the strategy and then the longer term recommendations. Staff from across ORD will be involved in the implementation steps and it is envisioned that staff and managers from across ORD will all actively participate in the WAB.

2. The Title 42 Program

ORD received Title 42 authority in 2006. This authority allows ORD to recruit and retain world class scientists and engineers to strengthen EPA's research and development programs in support of the Agency's mission and to shape decisions on emerging environmental issues. In the 10 years since ORD received its authority, ORD's Title 42 employees have created a catalytic change in EPA's research direction and have had a significant impact on the Agency's mission. This change is reflected in the expansion of our public health expertise and impact, and in the move to using computational approaches such as ToxCast for risk assessment. EPA has become a recognized leader in developing cutting edge science needed to address 21st century environmental challenges in large part due to the use of the Title 42 authority.

Results of this effort include:

1) Title 42 employees worked on the ToxCast application, a relatively inexpensive way (approximately $30,000 per chemical) to prioritize chemicals for Tier 1 EDSP screening (approximately $1,000,000 per chemical)
2) Title 42 employees are protecting public health and natural resources and responding to

emergencies ranging from unsafe drinking water to air pollution from wildfires,

3) Title 42 appointees are leading EPA's sweeping improvements to the IRIS process
4) Title 42 employees contributed to the rapid research response efforts during the Deep Water Horizon emergency

3. Emeritus Program

Given ORD's large number of retirement eligible scientists and engineers, as well as the current and future fiscal picture, ORD needed an innovative way to ensure retention of critical science and technical expertise. ORD worked closely with OARM and OGC to develop and implement the new ORD Emeritus program. This program resulted in a new innovative mechanism that allows ORD to retain critical expertise and knowledge in a challenging fiscal environment.

The Team's efforts allowed ORD to create a unique program that so far has resulted in the selection of eight science emeritus appointments addressing the loss of institutional knowledge in the scientific and technical research staff. The ORD Emeritus Program mutually benefits management and staff. For management, it is a tool to help address the loss of institutional knowledge and knowledge transfer critical to ORD's research programs while freeing payroll resources to meet other needs. For staff, it provides an opportunity to continue to make valuable scientific contributions to the Agency post-retirement. Participants maintain access to laboratories and the ability to publish research, represent the Agency, and, most importantly, assist EPA in accomplishing its mission.

4. ORD Technical Qualification Board (TQB)

ORD has a policy requiring that its Labs and Centers establish peer review panels, known as Technical Qualifications Boards (TQBs), to review and evaluate the qualifications and contributions of its scientists/researchers for promotion to senior (GS-14/15) levels. The ORD Policy allows flexibility across the Labs and Centers in the administration of the process. Not only did the Lean group reduce the processing time by 50% and steps in the process by 65%, but it also developed a consolidated, consistent process for administration of the TQBs across ORD. Union partners have been briefed on the Lean event results. OARS is currently working to develop an automated system for submitting, tracking and processing TQB promotions.

The new TQB process will reduced processing time by 50% and the number of steps in the process by 65% once fully implemented.

Information Technology (IT) Initiatives

1. National Center for Computational Toxicology (NCCT) Pilot Project

This pilot project provided NCCT with quick, agile IT/IM support to ensure they have the computing power and environment to accomplish their scientific work. A critical issue within NCCT is the challenge of maintaining an up-to-date computer infrastructure. The computers in daily use are between 4 and 7 years old. Without up-to-date computers the efficiency of research, as well as delivery of products, is adversely impacted. The adverse impact can be measured by metrics for:

1) computing time for data and CPU intensive modeling
2) logon times currently running between 5 to 20 min with the older machines

The introduction of new hardware systems for NCCT resulted in a 30% improved efficiency. Using a typical NCCT salary of $100K per year, a cost savings of up to $30K per employee per year can be achieved.

2. Optimized Library Resources for ORD

Due to decentralized acquisition, journal subscription prices were not uniform across EPA and sometimes subscriptions were only accessible as print copies at individual sites/libraries. Varying library budgets and annually increasing journal costs, certain highly requested resources were not always available across the Agency. With the changing landscape of journal publishing, there continued to be growing interest in open access options. ORD partnered with OARM and OEI to find better solutions to the ever-growing need by EPA scientists for more access to journals.

By negotiating with publishers to reduce costs, ORD has been able to gain Agency-wide online access to many titles while saving money. ORD now provides Agency-wide access to more than 1,700 titles via the Desktop Library – an on-line system that provides desktop access to premium subscription-based information. In 2010, ORD partnered with OEI to extend access to Web of Science to the entire Agency. ORD also negotiated a membership with BioMed Central which allows all EPA researchers to receive

3. Electronic Clearance System for ORD Products

The Scientific and Technical Information Clearance System (STICS) is an electronic clearance system that was developed to automate and streamline the paper-based review and approval process for clearing ORD products. Prior to STICS, there was duplicate data entry and scientists weren't able to see where their products were in the clearance process. Paper-based review forms were more easily misplaced and others outside of the direct routing were not always privy to ongoing clearances. Most importantly, it was difficult to look across all clearances and provide additional analysis and reports.

To address these issues, ORD developed STICS, which provides electronic routing, approval, tracking, reporting and record storage for ORD scientific and technical products. Researchers easily track the status of their clearances within the system as well as via email notifications. In addition, the 'cc' functionality allows other stakeholders like the National Program Directors to view products and receive alerts as relevant products are cleared. The system can be accessed remotely and as the standard ORD-wide clearance system, provides an accurate and complete snapshot of ORD research products.

STICS was rolled out across ORD in February 2012. By end of August 2016, ORD had cleared more than 12,000 products through the system. Of these 12,000 products, about 10,600 were published and had corresponding Science Inventory records that were automatically created by STICS, which is an estimated savings in ten hours of researcher, manager and support staff time entering and

tracking clearance for each product.

4. **Modernization and New Technology**

Promoting the reuse of software components an efficient and cost effective approaching to using environmental software. ORD, through supporting through training and continued colleague interaction, has helped to facilitate the wide use three critical software platforms, GitHub, Reusable Component Services (RCS), and R. ORD researchers use GitHub code repositories to collaborate on software development projects and share code in real time. OSIM developed guidance for using and contributing to RCS which provides a central point of access to a broad range of components and services cataloged and stored in various registries and repositories. RCS promotes sharing and reuse of information and assets, maximizes resource efficiencies by reducing redundant investments, and promotes faster and efficient development through real-time collaboration.

5. **Virtualization of ORD Servers**

ORD continuously strives to improve efficiency and reduce costs for infrastructure services. Virtualization of ORD's servers delivered cost savings resulting from standardization of operations that allows ORD's infrastructure to be managed with fewer support staff. It was also a green initiative because reducing the number of physical servers lowered energy consumption, and helped reduce the footprint of ORD's raised floor computer rooms

Considerable cost savings have been realized due to (1) reduced need for support staff, (2) reduced need for physical servers (50% less), (3) lowered energy consumption, and (4) reduced facility costs.

6. **Expanded Campus Wireless Access**

Research is a collaborative process requiring common access to materials, tools and data. Wired networking is costly, inefficient and cumbersome in a conference setting.

ORD installed and deployed wireless network access in every ORD conference room and facility wide in 9 smaller non-co-located sites.

Access to wireless increases capabilities for real-time collaboration among the researchers while increasing the efficiencies of each researcher to access critical information outside of their offices.

7. **Established LabLAN**

Research instruments often require software and or hardware that cannot be configured in compliance with federal security standards. Significant investment would be required to upgrade otherwise working instruments to meet the new security standards.

ORD established and implemented LabLAN, an isolated network to protect sensitive lab instruments connected to scientists' offices without the potential for compromising the Agency network. LabLAN helps save resources by allowing use of older lab instruments that cannot be supported without the existence of this network. It also increases research efficiencies by enabling scientists to work remotely on their lab instruments from their office desktop or from home.

8. **ORD Road Map for Software Applications**

Software life-cycle management in EPA can be a complex, multi-faceted process requiring many steps and participants. ORD software developers have been asking for definitive guidance on managing their applications and models. To address this business need, OSIM developed the Roadmap which is a one stop shop providing a detailed guide to assist software application

developers with the steps needed to conceptualize, plan, develop, deploy, maintain, and retire a software application. The Road Map is intended to minimize surprises or unexpected delays/costs. The Road Map includes recommended documentation, identification of where approvals are needed, and links to important information so that total life cycle costs are considered.

This guide saves developers not only time up front but helps eliminate the potential for missing required steps and repetition of work.

9. ORD Application Inventory System

The 2014 Federal Information Technology Acquisition Reform Act (FITARA) contained provisions for better management of IT resources, which supports an ongoing need within ORD in application portfolio management. ORD has several hundred applications and models with new ones continually under development. In response to the need to manage these applications, ORD developed the Application Inventory, which was designed to promote better IT investments, reduce duplicative work, increase communication and collaboration, improve timeliness and accuracy of responses to external data calls and allow better, more targeted customer service for application.

10. ORD Expertise Location System

The need for a single, authoritative expertise location system was outlined by several cross-ORD workgroups. In a matrix organization with emphasis on integrated transdisciplinary research, it was difficult for researchers and managers to locate experts beyond their immediate organization. After gathering requirements, OSIM selected VIVO (an open source, semantic, web application) as the tool for ORD's Expertise Location System. VIVO integrates profile information for ORD federal researchers and collaborators from authoritative sources including OMIS HR as well as user input. In addition to journal articles automatically loaded from Web of Science, the system includes network and research visualizations, article metrics, and allows researchers to input expertise and supporting information.

The ORD Expertise Locator System has saved researchers and management significant time and money by efficiently identifying in-house expertise for high profile, fast turn-around projects and for research-specific needs.