

# MOSAIC

The Modernization  
of Safeguards  
Information Technology:  
*Completing the picture*



**IAEA**

*60 Years*

*Atoms for Peace and Development*



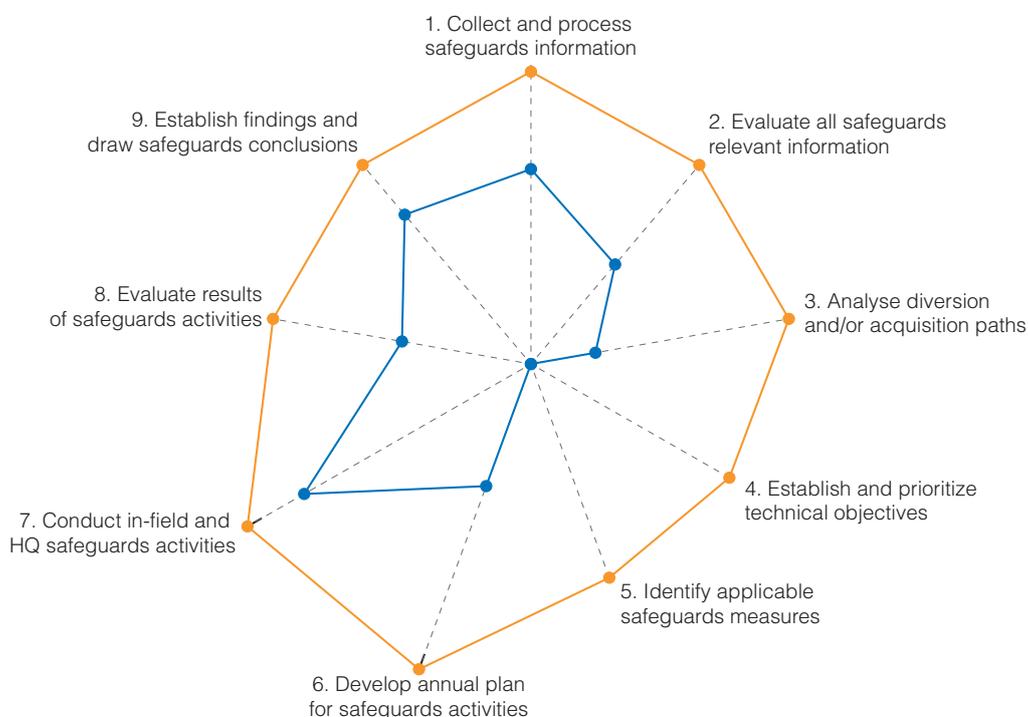
# MOSAIC: THE MODERNIZATION OF SAFEGUARDS INFORMATION TECHNOLOGY

The Department of Safeguards, International Atomic Energy Agency (IAEA), has set an objective to have a modernized IT system in place in 2018 that will allow it to perform safeguards implementation processes (shown by the chart below) more efficiently, effectively, and securely. The foreseen benefits will allow the Department to be more productive, in turn allowing Safeguards to meet the rising demand for its services.

This publication summarizes the Department of Safeguards' actions to modernize its information technology (IT) capabilities through the MOSAIC programme. Following the successful migration of Safeguards data from outdated mainframe technology, the MOSAIC programme was initiated in 2015. Within these pages, we describe some of the achievements of MOSAIC to date, and what remains to be done before the programme is completed in 2018.

## IT Support to Safeguards Implementation Processes

| 2015 | 2018





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# MOSAIC: A VITAL COMPONENT FOR EFFECTIVE NUCLEAR SAFEGUARDS IN THE 21ST CENTURY



**By Tero Varjoranta**

The key mission of the Department of Safeguards has not altered since the IAEA was established nearly 60 years ago: to deter the spread of nuclear weapons by the early detection of the misuse of nuclear material or technology. This is achieved through the application of Safeguards — a set of technical measures applied by the IAEA on nuclear material and activities. However, the environment that safeguards works within, and the technologies that we deploy to fulfil our mission, continue to evolve.

The demands on the Department of Safeguards continue to increase. Today, the Department is implementing safeguards in 181 States. From 2010–2015, the number of States with Additional Protocols increased by 22%, the number of Nuclear Material Accounting Reports increased by 20%, and the amount of nuclear material under safeguards increased by 17%. With a fairly static budget this means we need to improve our productivity. One of the ways in which we achieve this is through investment in modern technologies.

The MOSAIC programme is the IT foundation from which nuclear safeguards implementation will be enabled going forward. Through the creation of new software and applications, benefits can be realized in improving safeguards-relevant interaction between the Agency and Member States, connecting staff in the field with those at headquarters, and enhancing collaboration between Safeguards staff. As a result, MOSAIC will enable Safeguards to work more efficiently and effectively.

Following initial preparations, modernization activities started with the establishment of a secure IT environment (2005–2009), followed by the partial modernization of software applications (2007–2011), and continued with the transfer of data and software applications to a new platform (2012–2015). The latter endeavor — the mainframe migration — was a notable success: completed on schedule and within scope and budget.

The MOSAIC programme (2015–2018) is developing applications and software to take Safeguards IT into the future. As has been the case with previous Agency IT projects, the MOSAIC programme is funded from a combination of the Regular Budget, the Major Capital Investment Fund, and extrabudgetary contributions. The current estimate of the total cost of implementing the MOSAIC project is approximately €41 million.

To ensure MOSAIC meets the requirements of users, it provides bespoke, in-house developed, solutions

that will improve the structure and integration of all safeguards information within a modernized safeguards IT system. Safeguards staff will be provided with improved and timely access to information. The introduction of new and improved IT applications and their integration with existing ones will allow better planning, conducting, reporting, and quality assessment of safeguards activities. They will enable staff to search information across the entire repository; carefully cross-check different types of information; and utilize information in visual formats (e.g. overhead imagery). This will help the Agency to better preserve its institutional knowledge. Across the Department, we are already seeing the fruits of this labour through gains in efficiencies, effectiveness, and communication.

MOSAIC is also improving Safeguards information security. It is laying the infrastructure to ensure the security of Safeguards information in a world where cyber-threats are increasing in number and complexity. We are also improving our own internal data security arrangements by enhancing our IT capabilities along with strengthened authorization management and information classification.

Importantly, the Management Team that has been put in place for MOSAIC is keeping the programme on track. I am supported by the Senior Supplier, the Senior User, and the MOSAIC Programme Coordinator. We have continual oversight on MOSAIC planning, resourcing, implementation, communication, and

budget. MOSAIC staff track and report on all elements of the programme resources and budget to ensure that we are being cost conscious and guaranteeing value on investment. This also allows us to convey to our Member States the progress-based nature of the programme; the funding of the MOSAIC programme is contingent on demonstrated results.

One of the elements of the MOSAIC programme that has really impressed me is the human factor. The system incorporates established practices in programme management and IT development, and allows lessons learned to be applied. This means Product Owners have direct access to the people analysing the business need and developing the solutions. It is a remarkably flexible platform, with the ability to add, modify, and integrate new applications in an agile manner whenever needed. Thanks to the dedicated work of the staff, MOSAIC is progressing on schedule, within budget and scope.

MOSAIC is not reinventing the way we apply safeguards, but we need to be proactive to meet current and future challenges. By employing modern IT solutions to the work of Safeguards, and continually reviewing the utility of new technologies for use in implementing our mandate, we will be able to keep pace with these challenges. By taking this proactive approach, the IAEA Department of Safeguards will continue to play an important role in the maintenance of international peace and security in an ever changing world.

# MOSAIC: SUPPLYING SOLUTIONS

## By John Coyne

The MOSAIC programme is transforming the IT of the Department of Safeguards. Made up of more than 150 staff and contractors, MOSAIC is bringing together different ideas and delivering exciting results.

As Senior Supplier for the MOSAIC programme, I oversee project management — including software development, IT infrastructure, and user support resources. I ensure that the required IT-related resources are supplied to support programmatic activities and that our staff have all the tools they need to make MOSAIC a success. I work with the Deputy Director General, the Senior User, and the MOSAIC Programme Coordinator to gain a holistic view of the programme and make sure that, whenever there is an issue with supply, we resolve it.

When mainframe migration got underway in 2012, we set off to replace several old systems that were being supported by an aged mainframe computer. This phase of the modernization effort, 2012–2015, was devoted to moving off the mainframe computer to a new environment. The new Integrated Safeguards Environment provides



**“MOSAIC’s objective is to deliver the best quality software for the Department so that staff can get their work done in the most efficient way. It is not to create bureaucracies; it is not to create papers that are going to die. It is to create great software, and everyone gets that message.”**

### John Coyne

*Director, Office of Information and Communication Systems,  
Department of Safeguards, IAEA*

*MOSAIC Senior Supplier*

modern and secure hardware from which new applications can be built. It was a big job involving the transfer of more than 60 million records while ensuring business continuity, but we completed it successfully, on time, and on budget.

Once this was complete, we began to produce new and improved tools with which the Department of Safeguards can perform its work. It is not about changing what the Department does; we are delivering systems which are driven by humans so that the logic behind decisions can always be explained. It is about making what the Department does more efficient and effective by removing the manual, time consuming tasks which relied on out of date technology.

The MOSAIC programme (15 May 2015 to 15 May 2018) is composed of over 20 different software development projects, working together to build a solid foundation from which the Department of Safeguards will be able to perform its work into the future. Behind this are the people who work on these projects, whether they are Product Owners, Project Coordinators, Business Analysts, Technical Leaders, Developers, or one of the many others who contribute.

My colleagues pursue an agile approach to tackling, and overcoming, the challenges they face. Without such an approach we would not be where we are; if there are changes and adjustments along the way, and in software development there almost always are, we are able to react appropriately. Through this approach we have applied many lessons learned and laid down the foundations not only for MOSAIC, but also a blueprint for conducting future Departmental IT projects.

Ultimately, we want to provide a suite of applications to Safeguards that fit together. It is one thing to develop a wonderful piece of software that three people can use; it is another thing if around 900 people can use it. We have gone a long way to achieving that, not just in the existing systems but also in the new ones. Completing this will be a key metric of success in 2018.

## WHY IS MOSAIC IMPORTANT?

The MOSAIC programme, by using IT to create efficiencies, is empowering Safeguards staff to manage their resources more effectively toward core tasks. While the activities that Safeguards perform will not change, tasks that used to be paper-based are moving into a digital environment. The potential for more collaboration, data quality improvement, exception checking, while removing duplication of effort, mean that MOSAIC will cut the time currently spent on administration and paperwork. “The MOSAIC applications are a must have for Safeguards staff”, says Serin Baubec, Section Head of User Support, Office of Information and Communication Systems in the Department of Safeguards. “MOSAIC gives the staff of Safeguards the capabilities they need to maximize their productivity by providing new and time-saving functions.”

Importantly, MOSAIC is also providing the tools to meet the challenges of the future. By not investing in the modernization of IT now, the Department would run a risk of not being able to keep pace with change and demand. “We had to break with used patterns of activity. Maybe 10 or 15 years ago, our previous way of IT provision may have been the best way of working. But with the old model you could not keep improving. MOSAIC

was a development which unchained new capabilities in an unprecedented way. It was needed”, adds Serin.

MOSAIC is making sure the Department is applying IT industry standards, both technically and in project management.



**“In the context of a static budget, we needed MOSAIC to deliver to our users the IT capabilities to perform their duties to the same high standards into the future.”**

**Serin Baubec**

*Section Head of User Support,  
Office of Information and  
Communication Systems,  
Department of Safeguards, IAEA*

However, there has also been an important by-product. “One of the biggest challenges in setting off on a project like this is getting the users engaged”, notes Samantha Gehring, Risk Management Specialist in the Office of Information and Communication Systems. “Sometimes building the bridges and communication needed between IT staff and users can take a very long time. But, right now, we are seeing those bridges being constructed. The Department can build on these.”

As users see the benefits that MOSAIC is bringing, Safeguards staff are enthused. “We deal with interdisciplinary staff from across the Department and therefore our strategy has been to communicate on different fronts”, notes Silvia Mantilla, Project Outreach Officer in the Office of Information and Communication Systems. “We have, among others, newsletters, forums, infographics, and videos about MOSAIC. We are thinking more from our audience perspective what do they really need, and we are listening to everyone’s comments in any way, shape, or form.” With MOSAIC due to complete on 15 May 2018, maintaining that engagement among stakeholders will be an essential criterion in developing the software that Safeguards will rely on going forward.



**“MOSAIC has been the push that was needed to propel Safeguards IT forward.”**

**Samantha Gehring**  
*Risk Management Specialist,  
Office of Information and  
Communication Systems,  
Department of Safeguards, IAEA*

# HOW IS MOSAIC WORKING IN PRACTICE?

Implementing a €41 million, modern IT programme in the unique environment of the Department of Safeguards has presented a particular set of challenges. To tackle and overcome these, MOSAIC utilizes a custom blend of project implementation methodologies to achieve results. MOSAIC has adopted a flexible approach in developing applications, and meeting user and programmatic demands.

The MOSAIC programme comprises over 20 projects, each of which is being implemented following internationally recognized methodologies. “We are using the best practice of two worlds: the clearly defined project management methodology PRINCE2 and, for the delivery of software, the SCRUM Agile framework”, explains Remzi Kirkgoeze, Section Head of the Project Section, Office of Information and Communication Systems within the Department of Safeguards. The project management methodology PRINCE2 is used for the organization of MOSAIC. PRINCE2 allows management to exercise control over project initiation, budget, resources, risk, dependencies, quality management, and progress review in line with objectives.



**“We are a living, unique organization. We could not take pre-defined project management and delivery methodologies and apply these blindly. We adapted these methodologies to our needs so that we could manage the involvement of both the supplier side and the business side.”**

**Remzi Kirkgoeze**  
*Section Head of the Project Section, Office of Information and Communication Systems, Department of Safeguards, IAEA*

“The project lifecycle includes initiation, planning, execution, monitoring, and closure”, says Remzi. “We adapted the PRINCE2 methodology a little to suit the needs of Safeguards. One of the most important elements is that the user is involved at all stages of the process.”

“The approach adopted involves a development team having a set amount of time in which to provide to users a defined array of functionalities”, according to Vipin Thomas, SCRUM Master in the Office of Information and Communication Systems. Daily stand-up meetings are conducted, often with the Product Owner present, to update team progress and to raise any problems. These stand-up meetings allow issues to be resolved quickly, and streamline the way forward so that the deliverables are provided on time and to specification. “We involve Product Owners directly so the SCRUM Master and development team can make sure expectations are met in the shortest time. This also gives Product Owners more confidence in their products”, adds Vipin. Finally, a retrospective is undertaken where team members report on what went well, what did not go well, and where lessons learned can improve performance in the future.



**“We have received so much appreciation from our colleagues in Safeguards because we are fulfilling their expectations, staying on budget, and meeting our schedule. That is very good news.”**

**Vipin Thomas,**  
*SCRUM Master, Office of Information  
and Communication Systems,  
Department of Safeguards, IAEA*



**“The new solutions that  
MOSAIC provides are  
focusing on the needs of  
our interdisciplinary staff.”**

**Haroldo Barroso Junior**

*Director, Division of Operations C,  
Department of Safeguards, IAEA*

*MOSAIC Senior User*

# MOSAIC: MAKING OUR OPERATIONS MORE EFFICIENT AND EFFECTIVE

## By Haroldo Barroso Junior

Within this section, you will find case studies of several applications being produced under the MOSAIC programme. These applications will make Safeguards more efficient and effective. New nuclear facilities and material are causing the demand for Safeguards' services to increase. As a result, these applications are not a luxury; they are essential to ensuring the quality of Safeguards service going forward.

As the Senior User of the MOSAIC project, I am responsible for identifying the current and future departmental needs of inspectors, analysts, and other IT users. I work with the MOSAIC Programme Coordinator and the Senior Supplier in supporting the Deputy Director General of Safeguards in making major decisions related to the planning, implementation, and communication of the programme.

The new solutions that MOSAIC provides are focusing on the needs of our interdisciplinary staff. Communication within the project teams responsible for developing the applications has been free-flowing. Our designated Product Owners, the lead users of a product,

are in regular contact with the Business Analysts and Developers to express their requirements. This means that our user needs are driving development, and the results have so far been impressive.

However, one of the single most successful aspects of MOSAIC is that we are changing Safeguards information technology from being person dependent to being role dependent. With the previous mainframe computer and applications it supported, we were reliant on a shrinking number of staff who knew how to operate the technology. Today, MOSAIC is providing user-friendly tools that can be used by staff across the Department. As a result, we are able to pool ideas and increase cooperation. I see users who are positive and motivated to address all areas where Safeguards work can be streamlined, and benefits can be realized through MOSAIC.

When MOSAIC is fully implemented in May 2018, I have no doubt that the user community, whether Safeguards Inspectors, Analysts, or any other group of users, will have a set of tools capable of tackling the increasing demands of providing nuclear safeguards into the future.

## CASE STUDY

# STATE DECLARATIONS PORTAL

The State Declarations Portal (SDP), one of the projects being handled under the MOSAIC programme, will be one of the IT systems most visible to those States and regional authorities with IAEA safeguards agreements. SDP will create a secure web-based system to support information exchange between States and regional authorities and the Declared Information Analysis Section in the Division of Information Management, Department of Safeguards. Once complete, SDP will offer States and regional authorities a new and efficient method of exchanging information with the Department.

Currently, the Department receives and provides feedback on nuclear safeguards declarations from State and regional authorities in multiple formats and via different channels. The current communication process can be lengthy and labour intensive, with a significant number of paper-based steps. “The current modes of transmission for State and regional authorities of nuclear safeguards declarations can be via email, post, fax, or delivered in person from a Mission here in Vienna. How we reply is via similar means. It is all very manual”, says Alain Rialhe, Section Head of the Declared Information Analysis Section, and Product Owner of SDP.

The main benefits of SDP will come through the quicker and more direct transfer of information, statements, and reports between the Department and those State and regional authorities who choose to adopt this new method of communication. “It is a data exchange

hub for safeguards declarations”, explains Craig Parker, Systems Analyst in the Office of Information and Communication Systems, and Business Analyst and Project Coordinator of SDP. “SDP will provide an online, secure, web portal where State and regional authorities can upload information in encrypted format and receive communications and reports from the



**“Currently, when communicating with State and regional authorities, we call or send an email. We do not have direct, centralized, two-way communication. SDP will make communication quicker, more effective, and more efficient.”**

### **Alain Rialhe**

*Section Head of the Declared Information Analysis Section, Division of Information Management, Department of Safeguards, IAEA*

*Product Owner of the SDP project*

Department. It will also provide a secure means through which the Department and a State or regional authority can exchange information about any issues with the reported data, requests for approval or clarification, etc.” Additionally, SDP will allow authorized Safeguards users to access a centralized audit trail of all communication with a given State or regional authority, aiding staff knowledge continuity and institutional memory.

SDP is an example of the Department of Safeguards responding to Member States’ expectations by modernizing its IT systems. Not only will time and effort be saved, but there will be increased transparency for States and regional authorities on the handling and status of their declarations. “Many of the States themselves have similar portals that they use internally for receiving information from facilities, so they are used to having these services and they expect us to do the same”, adds Craig. “We are demonstrating that we can effectively modernize our business practices and offer services to the State and regional authorities to make their lives easier as well.”

One critical consideration of the SDP project is ensuring the security of information that goes through the portal. Confidentiality is a legal obligation in relation to State and regional authority safeguards declarations, and this has been central in the planning for SDP. “Security is the main consideration with SDP”, notes Alain. “Nothing will go through SDP without being encrypted. This is the only way to tackle this.”



**“Most of the MOSAIC projects tend to be inward looking applications. States see the benefit in the quality of the products that we produce but it is not something they interact with directly. In contrast, SDP is something they can be using each time they make a safeguards declaration or receive a report.”**

**Craig Parker**

*Systems Analyst, Office of Information and Communication Systems, Department of Safeguards, IAEA*

*Business Analyst and Project Coordinator of the SDP Project*

## CASE STUDY

# ELECTRONIC VERIFICATION PACKAGE AND FIELD ACTIVITY REPORTING

Safeguards inspections are a central element of the Department of Safeguards' work. In 2015, Safeguards Inspectors spent a total of 13 248 days in the field, and by the end of the year were inspecting 709 nuclear facilities, and 200 110 Significant Quantities<sup>2</sup> of nuclear material. This work is critical for the production of credible safeguards conclusions. MOSAIC provides several tools to aid Safeguards Inspectors in their work.

The Electronic Verification Package (eVP) application assembles and processes in-field verification activities, including their planning, reporting, and review. "When an inspector goes out into the field, they gather a large amount of Safeguards data and information which needs to be reported and further analysed at headquarters. Today, most of the process of gathering and reviewing the information reported from the field is done on paper", says Alexis Vasmant, Senior Inspector for State Level Coordination within the Department of Safeguards, and Product Owner for the eVP project. "Currently, to find the relevant piece of information for our work, we suffer from a loss of productivity by having manually to trawl through a mountain of paper."

eVP will link, display, and provide access to all available information associated with a verification activity. As a result, a Safeguards Inspector will have a single, electronic resource for preparing and



**“By 2018, when an inspector will prepare for a field activity, a single application, eVP, will provide them with the required information. They will be able to focus entirely on the goal of their activity, rather than chasing paper.”**

**Alexis Vasmant**

*Senior Inspector for State Level Coordination,  
Department of Safeguards, IAEA*

*Product Owner for the eVP project*

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<sup>2</sup> A Significant Quantity is the amount of nuclear material for which the possibility of manufacturing a nuclear explosive device cannot be excluded.

recording verification. But eVP will not only digitalize information so that it can be analysed; it will also provide for workflow management, quality checks, status tracking, knowledge preservation, and process management review. “Another important benefit of eVP is that we will be able to gather information on how to improve our processes”, adds Alexis. “eVP will help us streamline our work, find efficiency gains, and therefore allow us to send our statements to States faster.”

While eVP is associated with information gathering and review, the Field Activity Reporting (FAR) application provides a comprehensive solution to assist inspectors in reporting activities performed. FAR integrates structured data from all verification related activities to provide a comprehensive picture of how an inspection was conducted. “FAR is a platform for standardizing our reporting of the conduct of inspections”, says Madiba Saidy, Nuclear Safeguards Inspector within the Department of Safeguards, and Product Owner of the FAR project. “FAR provides multiple advantages including data quality and completeness checks. Overall, it means that the Department spends less time fixing data errors and exceptions.”

There are plans to integrate eVP and FAR, plus other applications, so an inspector has a single, user-friendly, repository of information for what they do, and what

they find, while in the field. “By 2018, we will provide an IT solution for all the needs of inspectors in the field”, say Xiaojing Wang, Systems Analyst / Programmer, Office of Information and Communication Systems, and Business Analyst for the FAR project. “Inspectors are our main user group. We meet on a daily basis to define their requirements and find the appropriate technical solutions.”



**“Inspectors are our main user group. By 2018, we will provide an IT solution for all the needs of inspectors in carrying out a nuclear safeguards inspection.”**

**Xiaojing Wang**  
*Systems Analyst/Programmer,  
Office of Information and  
Communication Systems,  
Department of Safeguards, IAEA  
Business Analyst for the FAR project*

## CASE STUDY

# COLLABORATIVE ANALYSIS PLATFORM

As envisioned in the 2014 report to IAEA Board of Governors,<sup>3</sup> the Collaborative Analysis Platform (CAP) project is trialling an analytical platform that can be an asset for Safeguards' core processes: planning, information collection and analysis, verification, and evaluation. CAP gives users the capability to search, collect, and integrate multiple data and information sources to enable comprehensive analysis. "CAP is a suite of software applications that can increase the effectiveness and efficiency of the collection and processing of Safeguards-relevant information available to the Department. It also can facilitate the evaluation of that information", says Fabian Rorif, Nuclear Safeguards Inspector within the Department of Safeguards, and Product Owner for the CAP project. "CAP allows users to simultaneously analyse a great deal of information, more than ever before, and see the links between the different pieces of that information."

State Evaluation Groups using CAP can perform information tasks at a speed and on a scale that was not possible in the past, therefore increasing the productivity of our current human resources. "CAP is a useful tool, but would not replace human capability to



**"CAP would represent a major leap forward in analytics, especially at a time when Safeguards resources remain constant and demands on the Department continue to grow. We need something creative, a game changer, to meet this pressing demand. CAP has this potential."**

**Fabian Rorif**

*Nuclear Safeguards Inspector,  
Department of Safeguards, IAEA*

*Product Owner for the CAP project*

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<sup>3</sup> Modernization of Safeguards Information Technology, Report by the Director General to the IAEA Board of Governors, November 2014, GOV/INF/2014/24

perform analysis. It would support and facilitate the analysis, but does not replace the analyst”, adds Fabian. “However, CAP would allow us to cope with a much greater amount of information, and also analyse that information in greater depth than before.” The ability to establish relationships between information from multiple sources, across time, and over ever increasing volumes of information, would ensure that Safeguards continues to make comprehensive findings.

CAP also shows promise with the collection and evaluation of open-source information relevant to the nuclear fuel cycle. CAP can collect and process much more open-source information than the Department currently has capacity for. This, in turn, would enable Safeguards Analysts to spend much more of their time conducting substantive evaluation. “CAP provides the capability to be able to automate the collection of open-source, public data”, highlights Daniel Calle, Information Analysis Engineer within the Office of Information and Communication Systems, and Business Analyst for the CAP project. “Essentially, trialling CAP is about assessing the possible solutions to allow our Analysts to spend more time on the Departmental mission, rather than dealing with manual tasks.”



**“CAP could make sense out of huge amounts of data that are relevant to our objectives. When demonstrated in the Department, it has worked really well so far. It seems that this way of working bears fruit and supports our mission.”**

**Daniel Calle**

*Information Analysis Engineer,  
Office of Information and  
Communication Systems,  
Department of Safeguards, IAEA*

*Business Analyst for the CAP project*

# MOSAIC AND INFORMATION SECURITY

Protecting safeguards information is a legal obligation for the Department of Safeguards and is, therefore, of paramount importance. As part of the MOSAIC programme, new features are being added to upgrade the security of Safeguards information and to protect against new and emerging threats.

“We need to guard our data. We need to assure our States that the information they entrust us with is protected. To do this we employ a defence-in-depth concept and have a layered, risk-based approach to the protection of our data. We do not rely on a single control. There are multiple checks in place if a control fails for any reason”, says Scott Partee, Team Leader of the Systems Engineering Team within the Office of Information and Communication Systems.

The Department takes the security of its information very seriously. Due to the sensitivity of Safeguards information, a security culture has developed within the Department and staff are continually kept informed of evolving threats. “The security culture in the Department is strong”, adds Scott. “It is noticeable that Safeguards security awareness is constantly improving. We are aware of the risk, and as threats evolve so will our defences.”

The MOSAIC programme is building in security features to all applications and networks. In addition, two

projects, Authorization Management and Information Classification, are tackling security concerns directly.



**“We take a layered defence-in-depth approach to Safeguards data. While we maintain IT and security expertise to provide the hard exterior, Safeguards data sits in its own secure environment with multiple additional protections.”**

**Scott Partee**

*Team Leader of the Systems Engineering Team, Office of Information and Communication Systems, Department of Safeguards, IAEA*

The Authorization Management project is streamlining the approach of managing access to Safeguards information. By setting clearly defined policy and procedures, the project will support access management in an efficient and effective manner across the Department. It will provide an easy way to govern and audit the access provision across Safeguards systems, and provide clear visibility into who has access to information resources. “Authorization Management will allow us to set information availability rights according to role, as opposed to person”, says John Lepingwell, Senior Inspector for State Level Coordination within the Department of Safeguards, and Alternate Product Owner of the Authorization Management project. “It means that we will enhance our governance, auditing, and accountability of access to Safeguards information. We will be able to monitor staff access to such information 24/7.” The new Authorization Management software will be demonstrated to users during 2017, and will then be tailored to meet their exact specifications. “Everyone in the Department has always taken information security seriously.

However, due to the increasing cyber threats over the last few years, staff awareness of the information threats particular to Safeguards has increased.



**“Everyone is aware of the kinds of threats that we face, and we continue training our staff on potential threats. People have begun to ask more questions such as ‘how can I improve the protection of this information?’ It is a cultural change which shows we are on the right path.”**

**John Lepingwell**  
*Senior Inspector for  
State Level Coordination,  
Department of Safeguards, IAEA*  
*Product Owner for the Information  
Classification project and Alternate  
Product Owner for the Authorization  
Management project*

The tools being developed under MOSAIC gives us the practical capabilities to complement this awareness”, adds John.

The Information Classification project is a broad, Department-wide effort to define and implement a standard procedure for the tracking of the highly confidential, paper-based information assets of the Department. The project will improve the overall quality, consistency, and transparency in the tracking of these classified information assets. Going forward, MOSAIC’s Information Classification project will also provide a software platform to support the standard procedure. “I collaborate with the Product Owners on a regular basis to elicit requirements, to define current processes, and to develop future processes for our projects”, says Didem Oguz Haydn, Business Analyst within the Office of Information and Communication Systems, and the Business Analyst for the Information Classification and Authorization Management projects. This close collaboration between Product Owners and Business Analysts is leading to the development of processes and software that meet the Department’s unique security requirements.



**“Information security threats constantly evolve. To continue to protect Safeguards information assets from these ever growing threats, MOSAIC provides additional tools that extend the capabilities of the current information security systems of Safeguards.”**

**Didem Oguz Haydn**  
*Business Analyst,  
Office of Information and  
Communication Systems,  
Department of Safeguards, IAEA*

*Business Analyst for the Authorization  
Management and Information  
Classification projects*

## MOSAIC: WHERE WE WILL BE IN 2018

From the user viewpoint, MOSAIC has been a programme directly focused on their needs, and is delivering tools based on their exact specifications. “Before MOSAIC we had well established procedures for our work, but there were a lot of variations and disconnected work flows, which added time. Through MOSAIC, we are developing modern, standard procedures that streamline the work”, says Ania Kaminski, Nuclear Safeguards Inspector within the Department of Safeguards. “There is a lot of potential being realized through the powerful group of tools that MOSAIC is creating. In 2018, time consuming activities will have been eliminated and more time will be available for inspections and analysis. It does not replace the human mind and the power of inspections and analysis, but it means that time can be allocated to other objectives.”

MOSAIC is not only improving the efficiency of Safeguards work; it also promises to improve data quality checks and aid the weeding out of erroneous information. “In 2018, MOSAIC will improve the reliability of the work of Safeguards”, says Igor Tsvetkov, Senior Level Inspector for State Level Coordination within the Department of Safeguards. “Human errors will be cut, follow-up will be quicker, monitoring will be improved, transparency will be enhanced, and the overall quality of our work will go up.”



**“By using technology to assist in reducing duplication of effort and streamlining processes, MOSAIC gives us more time to tackle our core verification activities.”**

**Ania Kaminski**

*Nuclear Safeguards Inspector,  
Department of Safeguards, IAEA*

*Product Owner for the Integration  
of Safeguards Instrumentation Data  
(ISID) project*

MOSAIC has also changed the way that the Department approaches the development of its IT solutions. Under MOSAIC, there has been a switch to a user centred focus coupled with the flexibility to respond to user needs. “Since MOSAIC started, we have gone from having an out of date mainframe computer, to having a rich portfolio of modern applications aligned with the business needs and mission of the Department”, notes Scott Miller, Section Head of the Development Section within the Office of Information and Communication Systems. “This has been a very productive period in software development for Safeguards.” Through the Agile development approach applied in the MOSAIC programme, the Department has hit on a winning formula in software development, and there is still more to come. “MOSAIC is allowing us to do things that we have always wanted to do”, adds Scott.



**“We are hearing good news, Safeguards customers are happy, and the people that came here to develop IT solutions with the latest technologies are successfully getting to do that.”**

**Scott Miller**

*Section Head of the Development Section, Office of Information and Communication Systems, Department of Safeguards, IAEA*

# THE MOSAIC TEAM

MOSAIC is being delivered by a culturally diverse, interdisciplinary team including IT developers, business analysts, project managers, risk analysts, and

communication specialists. The MOSAIC team is implementing international standards through innovation.



# MOSAIC: BRINGING THE PIECES TOGETHER

**By Florin Abazi**

As I write this, MOSAIC is in full swing: 30 appointed user representatives meet with their counterparts; more than 150 employees in the Department ‘sprint’ to ensure the delivery of products; MOSAIC application training sessions convene daily, coordination groups weekly, and forums monthly. As you read this, MOSAIC is improving how Safeguards does its business.

On a strategic level, as MOSAIC Programme Coordinator, I am accountable for managing the programme scope, schedules, and budgets to ensure that we are receiving value on investment and achieving results. I work directly with the Deputy Director General of Safeguards, Senior Supplier, and Senior User on programme priorities, resources, delivery, and implementation. On a project delivery level, I also interface daily with the various MOSAIC project teams to address issues, concerns, and activities requiring direction and decisions. As a result, I see the whole spectrum of MOSAIC, the elements that go into making this programme a success, and the people that are making the difference.



**“By bringing the pieces of MOSAIC together to complete application development by 15 May 2018, and ensuring the graceful transition of operations and closure of the programme by the end of 2018, Safeguards will take full advantage of a suite of tools with which to face the challenges of tomorrow.”**

**Florin Abazi**

*MOSAIC Programme Coordinator,  
Office of the Deputy Director General,  
Department of Safeguards, IAEA*

As this publication demonstrates, MOSAIC is a large project with a wide scope. We implement strong programme management control; PRINCE2 for strategy-driven project management and the Agile software development methodology SCRUM for software production. In tandem, these approaches are delivering bespoke solutions to the unique needs of our user community. To name only a few of the successes so far, we have a modern, integrated, and secure environment; we have new reporting modules for increased accuracy in field activity reporting; we have new, advanced search and analytical capabilities.

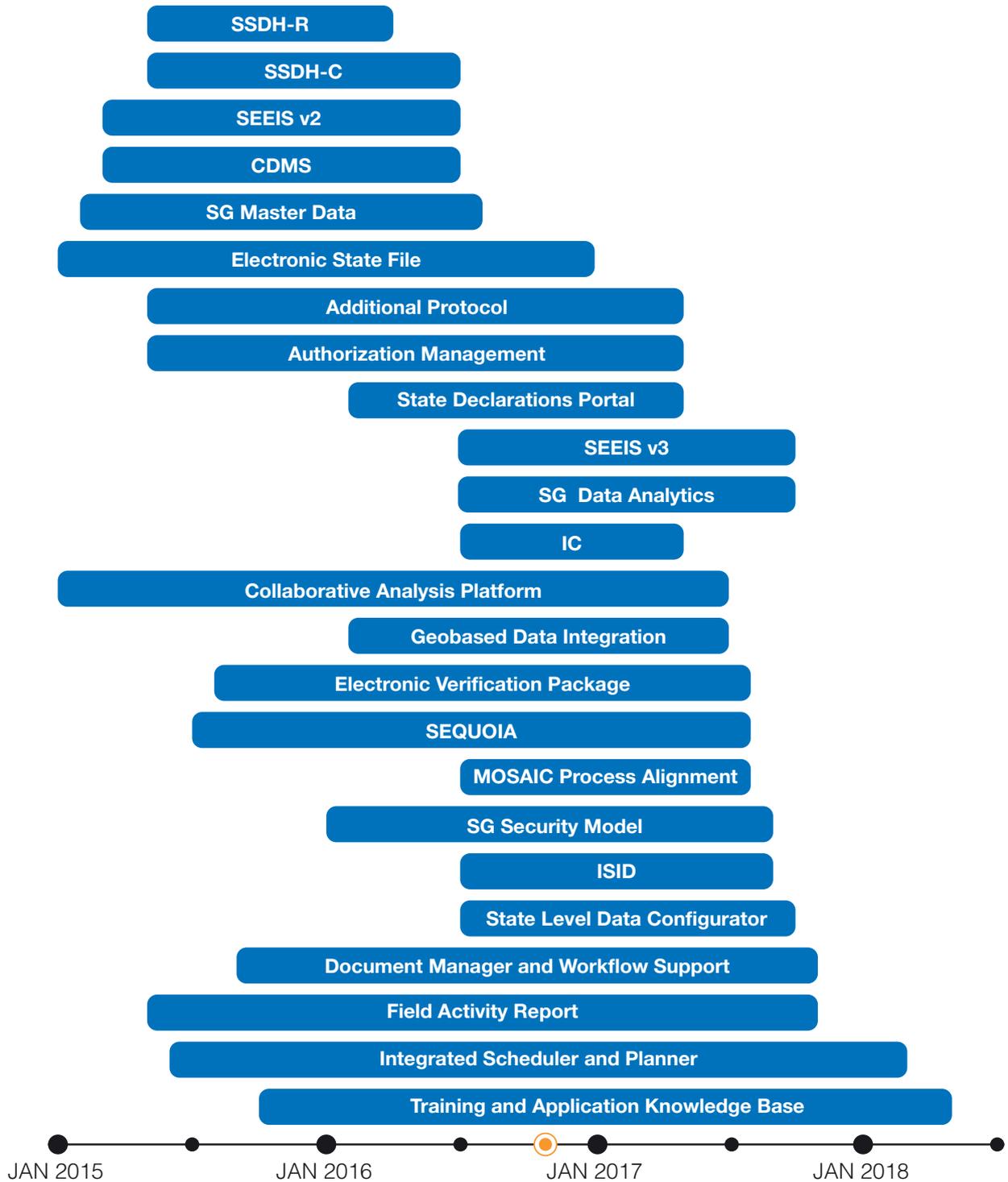
And what is so exciting is that there is still so much more to come before MOSAIC is completed. Highlights include a new inspection scheduling system, paperless verification reporting, and a secure web portal to communicate with State and regional authorities.

Of course, there are challenges that we need to overcome. For example, we need to train our users to use the new applications. But from speaking to the people involved in MOSAIC, understanding their motivations

and aspirations for the programme, and witnessing their positivity, I have no doubt that we will meet these challenges with vigour.

In all areas of safeguards, whether it be collecting and processing safeguards-relevant information, evaluating this information, or establishing findings, we have better tools now with which to perform this work compared to when the MOSAIC programme started in 2015. In bringing the pieces of the programme together and completing the picture, in 2018 the Department of Safeguards will be able to take full advantage of a suite of tools with which to face the challenges of tomorrow.

# MOSAIC TIMELINE 2015–2018



# THE PROJECTS OF MOSAIC

## **Completed:**

- Computerized Inspection Report Services (CIRS)
- Containment Data Management System, Version 2 (CDMS v2)
- Mainframe migration and associated parallel run and go-live activities
- Safeguards Effectiveness Evaluation Information System, Version 2 (SEEIS v2)
- Safeguards Master Data, Version 2 (SGMD v2)
- State Supplied Data Handling – Core, Version 2 (SSDH-C v2)
- State Supplied Data Handling – Reporting, Version 2 (SSDH-R v2)

## **Underway:**

- Additional Protocol System (APS)
- Authorization Management
- Collaborative Analysis Project (CAP)
- Document Management and Workflow Support (DMWS)
- Electronic State File (eSF)
- Electronic Verification Packages (eVP)
- Field Activity Reporting, Version 2 (FAR v2)
- Geobased Data Integration (GDI)
- Information Classification (IC)
- Integrated Safeguards Environment (ISE)
- Integrated Scheduler and Planner System (ISP)
- Integration of Safeguards Instrumentation Data (ISID)
- MOSAIC Process Alignment Project (MPAP)
- Safeguards Effectiveness Evaluation Information System, Version 3 (SEEIS v3)
- Safeguards Equipment Management System (SEQUOIA)
- Safeguards Data Centre Upgrade
- Safeguards Implementation Report Analytical Tool (SANT)
- Safeguards Security Model
- State Declarations Portal (SDP)
- State-Level Data Configurator (SLDC)

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*60 Years*

*Atoms for Peace and Development*