CREATING A 'ONE HOUSE' CULTURE AT THE IAEA THROUGH MATRIX MANAGEMENT

ROBERT E. KELLEY

SUMMARY

● The International Atomic Energy Agency (IAEA) is currently structured along largely programmatic lines, with each programme recruiting and training its own staff. This process is wasteful as it creates bureaucratic disincentives to sharing people and resources.

Many technical organizations in the business and government sectors deal with this problem by using matrix management. In matrix management, programme managers budget their funds and set programmatic objectives. This gives them a great deal of control over their programmes and the desired outcome. Staff, who are recruited as technical specialists by technical service organizations, not programmes, are then able to work on a multitude of programmes.

The IAEA acknowledges that it would like to work as 'one house' and this has been a goal of senior management for some years. Structural obstacles have meant that there has been little progress towards changing the management culture to the 'one house' goal. A thoughtful reorganization of the IAEA along programme–matrix lines could go a long way towards reaching this goal.

The International Atomic Energy Agency (IAEA) is charged with promoting nuclear energy around the world and with verifying that nuclear materials in states that have entered into safeguards agreements are only used in peaceful activities. The agency derives much of its funding and worldwide reputation from enforcing nuclear material safeguards under the 1968 Non-Proliferation Treaty (NPT), but it describes itself as being built on three pillars: (*a*) safety and security, (*b*) science and technology, and (*c*) safeguards and verification.

The current IAEA structure reflects this pillar structure: each pillar is responsible for hiring its own staff, setting its own goals and establishing its own standards. They have largely separate budgets and missions within the IAEA and often there is little overlap or communication between them. This leads to 'stovepiping': the idea that each pillar is separate from the other.[1] Communication between the pillars is not encouraged, with the result that resources are not efficiently shared and creativity is not propagated horizontally. Although the pillars share some common resources, such as budgeting, payroll, travel, conference services and similar administrative functions, technical information is largely compartmented.[2]

This business culture is not unique to the IAEA. For example, large research laboratories often have multiple programmes with multiple sponsors, which operate independently. However, the most successful laboratories use the multiple technical skills that they hire and develop across all programmes. This increases such a laboratory's competiveness and it offers exciting technical variety to its highly skilled staff.

THE 'ONE HOUSE' CULTURE

The former Director General of the IAEA, Mohamed ElBaradei, frequently expressed his hope that the IAEA could end this stovepiping to become 'one house'—that is, that

[1] The current IAEA stovepipe structure is illustrated in the organizational chart at <https://recruitment.iaea.org/documents/orgchart.pdf>.

[2] See e.g. Findlay, T., *Unleashing the Nuclear Watchdog: Strengthening and Reform of the IAEA* (Centre for International Governance Innovation: Waterloo, ON, 2012).

the whole of the IAEA would work cooperatively together on all its missions.[3] He and the other IAEA staff frequently expressed their disappointment that this did not happen.[4]

The 'one house' policy was feebly implemented by asking departments to cooperate, but there were few incentives to do this and power continues to reside in the hands of managers who control large budgets and have a stranglehold over career opportunities of their staff. Many of the managers are recruited from outside the IAEA for limited-term positions. They have little incentive to put long-term solutions in place because they will leave in a few years. Safeguards managers, in contrast, are usually promoted from within. They often have core support from long-term tenured safeguards staff who understand that loyalty and compliance are keys to promotion. They have little incentive to innovate.

In the technical units of the IAEA today, professional staff are hired, trained, housed in work units, evaluated and given career guidance by line managers who are subordinate to a de facto programme manager. This creates inefficiencies and conflict and virtually ensures that resources, especially human resources, are not shared and that information is not distributed reasonably across the agency.

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Most of the IAEA's mid-level safeguards managers have a background in nuclear material accounting and verification. They have little or no experience in, for example, the skills required to do state-level safeguards analysis such as exploitation of open sources, analysis of satellite imagery and synthesis of data. As a result, they view the staff who carry out analytical functions as 'support staff', subordinate to safeguards inspectors. If the 'support staff' were to support all of the IAEA's programmes, and not just safeguards, their overall contributions would soon become apparent.

'One house' is not achievable in the IAEA's present organization because the sharing of resources, skills and staff on the agency's technical side is not rewarded; indeed, the current programmatic goals actively discourage sharing of resources. This situation can be remedied by changing the organization of the IAEA technical structure to a programme-based matrix structure supported by technical disciplines managed by technical experts.

THE ADVANTAGES OF MATRIX MANAGEMENT

In matrix management, programme managers budget their funds and set programmatic objectives. Staff are recruited as technical specialists by technical service organizations and can be called on to work on a multitude of programmes. This gives the programme managers a great deal of control over their programmes and the desired outcome.

Because technical specialists can work for a number of

[3] E.g. Elbaradei, M., Statement to the IAEA General Conference, Vienna, 27 Sep. 1999, <http://inis.iaea.org/search/search. aspx?orig_q=RN:30044544>; and International Atomic Energy Agency, General Conference, *The Agency's Programme and Budget for 2004–2005*, GC(47)/3 (IAEA: Vienna, Aug. 2003), 'Major Programme 7'.

[4] Findlay (note 2).

programmes, they can use their technical skills to benefit the whole organization. They are trained to support all programmes to which they could contribute and are certified to conduct multiple tasks for more than one internal programme. Each member of staff resides in a technical unit, so the unit's management can have appropriate technical training to evaluate the staff member for critical assignments and can make more informed decisions about promotion and retention than if staff are supervised by a generalist with no experience in a particular discipline. This is a powerful morale-building factor for staff who want to associate with professionals in their own fields and be evaluated fairly by people they respect.

A programme–matrix organization is used by many large technical organizations and companies.[5] They see it as the best way to provide a technically satisfying work environment for highly trained staff. It also drives bottom-up innovation and allows maximum flexibility in the use of all qualified employees across the organization, assigning them to work where they are most needed.

Under a programme–matrix organization, staff gravitate towards managers who are forward-looking and programmes that provide challenges. If the IAEA were to adopt such a structure, then IAEA managers who treat skilled professionals as merely support staff would find that they must

restructure their programmes to be competitive and innovative if the best of the agency's technical staff want to work on their programmes.

Matrix management in the IAEA

The IAEA currently has several clear programmes: (*a*) nuclear materials verification under the NPT; (*b*) nuclear safety standards; (*c*) nuclear security; and (*d*) technical cooperation. In the future there could even be new mandates such as verifying a possible fissile material cut-off treaty (FMCT).[6]

Each of these programmes requires different training and standards. Currently, each function uses many people with similar skills who are tied to their specific programme and not encouraged to cooperate with other programmes. Under a programme–matrix organization, the engineers and scientists currently recruited individually for separate IAEA programmes would instead be employed in work groups with shared skills and interests, allowing them to be managed more efficiently and favourably.

The IAEA already uses a matrix structure for its administrative tasks. Most non-technical services are provided by a single department, the Department of Management. This department provides key finance, travel, personnel, conference, medical and information technology services, among others, and its legal and

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[5] E.g. Johnson, R., 'Advantages & disadvantages of matrix organizational structures in business organizations', Demand Media, <http://smallbusiness. chron.com/advantages-disadvantages-matrix-organizational-structures-business-organizations-26350.html>.

[6] See e.g. Kile, S. N. and Kelley, R., *Verifying a Fissile Material Cut-off Treaty: Technical and Organizational Considerations*, SIPRI Policy Paper no. 33 (SIPRI: Stockholm, Aug. 2012).
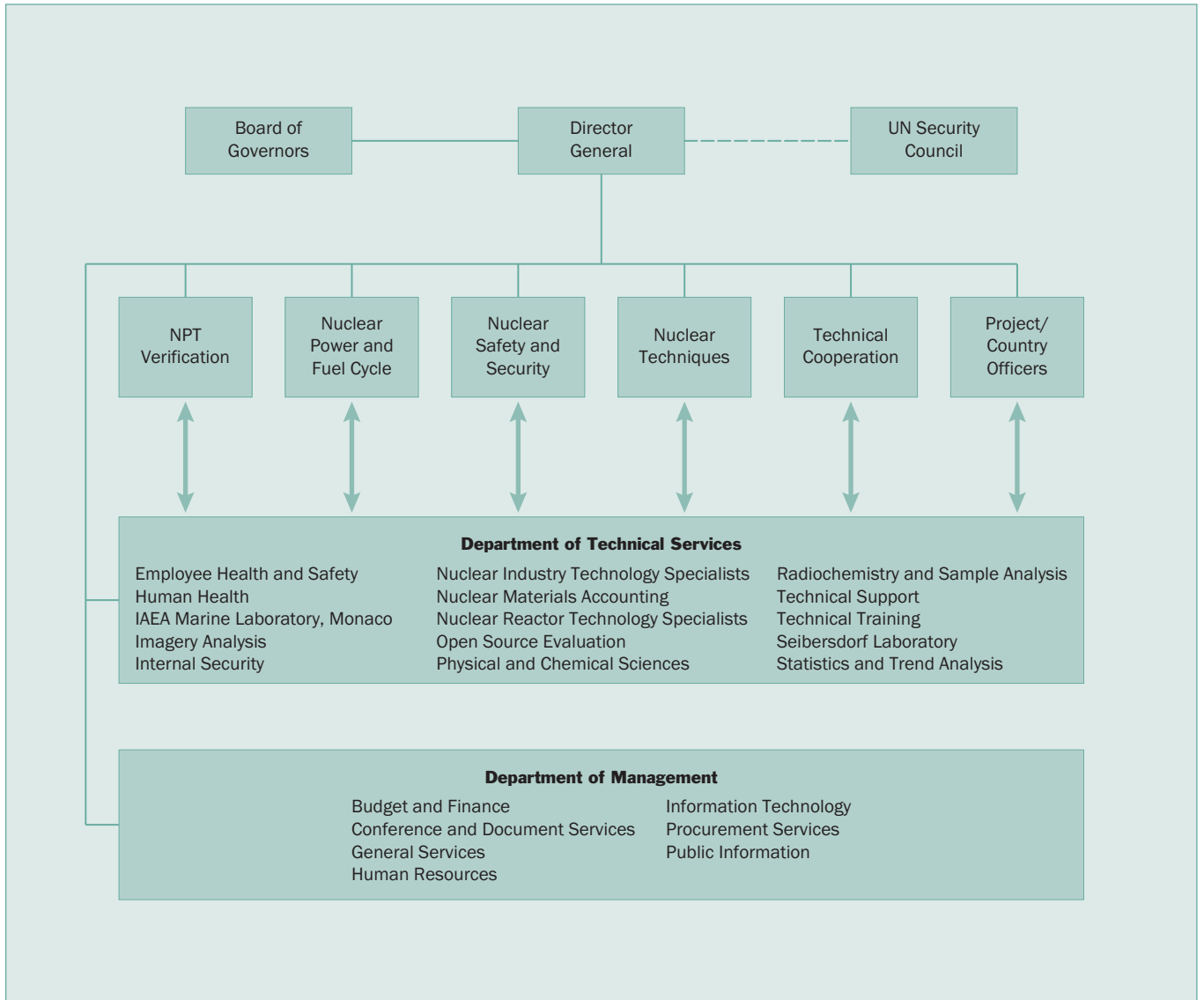
Figure 1. A proposed programme–matrix structure for the IAEA

external relations divisions are privy to virtually all of the IAEA's confidential information. The ability, loyalty and discretion of professionals in management services to support technical colleagues in all agency roles—for example, in handling highly confidential information related to several programmes—is never questioned. It should be the same with scientists and engineers.

The IAEA should recognize that its three pillars are programmes in the management sense, not line functions. The managers of these programme activities should be involved in programmatic planning, financial planning and assessment of results. If the programme managers were required to work together to plan and share resources for all the programmes and to reach compromises necessary for the health of the whole agency, the IAEA would become 'one house' out of necessity. The programme managers need not be directly involved in the hiring and staffing of the technical services that make the agency function. Figure 1 illustrates how a programme–matrix

organization at the IAEA might be structured.

Satellite imagery: an example of the potential of matrix management

Satellite imagery is an example of an agency-wide capability that would benefit all of the technical programmes. Satellite imagery is an extremely powerful modern tool for geospatial awareness, analysis and communication of complex situations.

The first part of the IAEA to develop satellite imagery was the Department of Safeguards, which has made a huge investment in hardware, software and trained personnel. However, it has isolated these capabilities and did not share or market them within the agency until the extraordinary circumstances of the Fukushima Daiichi accident in 2011 led to some reluctant sharing. If, instead, staff for a satellite unit were hired and supervised by a professional with expertise in the imagery field charged with providing services to the whole agency, and not just programmatic skills associated with verification activities, this would create a stronger team that serves all parts of the IAEA. For example, the satellite imagery section could also play a huge role in the success of the Nuclear Safety and Security programme.

Not all of the barriers to sharing are internal. Member states have many preferences about how their resources are used and can have a very narrow outlook. The satellite imagery section has been heavily subsidized by one member state, which has provided substantial funding and guidance. Member states should coordinate their own efforts to ensure that their resources are used to support all agency missions and not just one.

Even within the satellite imagery unit, there is sub-compartmentation. This means that some vital image indicators of nuclear activities or proliferation cannot be freely shared. But governments that engage in satellite imagery analysis for their own security needs long ago realized that good cross-communication within an imagery organization is essential for success.[7] While the IAEA's information security is often mentioned as a problem, this is really an excuse to avoid making changes. The IAEA trusts its administrative employees to protect information from multiple programmes; scientific and technical employees deserve the same respect.[8]

The compartmentation of work on satellite imagery is a reflection of an existing management experience base, trained in nuclear materials accountability, that does not understand the unique issues of this technical area and consequently treats it overcautiously. While IAEA member states have security concerns about the use of satellite images of their territory, such concerns are common to all levels of safeguards verification, whether it involves instrumentation, inspection procedures, open source analysis or imagery. If the false issue of security is dealt with, satellite

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[7] Brugioni, D. A., *Eyes in the Sky: Eisenhower, the CIA and Cold War Aerial Espionage* (Naval Institute Press: Annapolis, MD, Mar. 2010).

[8] Norris, P., *Watching Earth from Space: How Surveillance Helps Us—and Harms Us* (Springer: Dordrecht, 2010).

imagery could become a valuable tool for the whole of the IAEA.

MATRIX MANAGEMENT IN PRACTICE

Training

The current pillar structure trains its captive personnel in only the skills required for a particular programme. For example, IAEA safety experts carry out safety inspections around the world at the request of countries wanting outside expertise; IAEA technical cooperation specialists travel virtually everywhere in the world dispensing technical advice; and IAEA safeguards inspectors travel to all the countries that have declared nuclear materials and perform audits.

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Even among safeguards inspectors there are large variations in tasks. Some perform mostly auditing functions, examining books with nuclear materials accountancy records, while other inspectors perform spot checks of nuclear materials using specialized instrumentation. These are two largely separate tasks. Another safeguards task is to verify that the design of a nuclear facility is exactly as declared by the state. Experts in the Department of Nuclear Safety and Security might well be better qualified to carry out this task than materials auditors from the Department of Safeguards, but in the rigid line organization of today this does not happen because the safety experts are not certified safeguards inspectors and thus cannot carry out safeguards-related duties in member states.

Under a matrix system, any professional could receive basic training to reach a level of proficiency that would allow them to carry out simple inspections and visits consistent with their specialties. They would then receive additional training for as many areas as they are capable of and needed for.

For example, all IAEA staff who travel and carry out any kind of inspection would receive basic training in inspection procedures, policy, ethics and safety. They would then be additionally certified in technical skills such as nuclear materials auditing and accounting, design information verification, nuclear safety inspections or nuclear security evaluation. They may also receive specialized certification in nuclear fuel reprocessing or in enrichment (both applicable to all the cases above). There can be many variations, but no one inspector is likely to need or receive all of these certifications. A training process like this could hugely increase the pool of qualified inspectors from among IAEA staff and quickly identify those best qualified for a task based on their skills, experience and certification. These inspectors would naturally work on more than one programme as needed, and the stovepipes that impede the goal of 'one house' would be dismantled. Internal communications would be naturally enhanced.

In addition, a restructuring would be an ideal time for the IAEA to create employee health and safety units, and an overarching information security programme. The IAEA must be unique among high-technology organizations in not having a visible and effective employee safety programme.

Safety in hazardous work, such as with nuclear materials, industrial machinery, high voltages, and global health and safety threats (including disease and poor standards) dictate that safety should be a high priority. This is a chance to rectify that flaw.

Similar arguments can be made about security. Information security should be an agency-wide activity with one set of standards. It should not be the chaotic province of individual programme organizations.

Rotation policy

The rotation policy has a goal of ensuring that a majority of staff leave employment with the IAEA within seven years and that few staff are given contracts longer than seven years (essentially tenure).[9] Under a matrix system, professionals would be supervised and evaluated by other professionals in a similar discipline. This would allow for more objective performance appraisal with a goal of identifying the most promising staff for longer-term contracts. Under such a system the proportion of staff who leave the agency might decrease.

A key component of any evaluation system is judgment and objectivity in managers: if managers evaluate employees fairly and objectively, the organization benefits greatly and can retain and reward the best performers. Conversely, if evaluations are pro forma or subjective, hiring and rewards can be based on favouritism and the avoidance of confrontation. The existing rotation system makes decisions easier for managers who want to avoid confrontation.[10] Employees who do not conform can be easily let go without any formal justification, while those who quietly comply with orders can expect special treatment after seven years and then benefit from job protection.

Under a programme–matrix system at the IAEA, managers would be trained in the same skill sets as their immediate employees, which would greatly increase the chances of impartial and accurate evaluations. This would benefit both the agency and the employees on the basis of best value and fairness.

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Country officer points of contact

Each existing IAEA department has country officers for its regions, countries and facilities. Communication and coordination across departmental lines is actually discouraged. Thus, the departments of Nuclear Safety and Security and Technical Cooperation each have their own country officers and the Department of Safeguards has at least two country officers for each country, one for information management and one for operations. This is chaotic.

This can be addressed in a programme–matrix structure, albeit with difficulty. The goal should be that, for each country, the IAEA senior management would be able to turn to a single country officer who will be able to describe

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[9] Statute of the IAEA, approved 23 Oct. 1956, entered into force 29 July 1957, <http://www.iaea.org/About/statute.html>, Article VII(C).

[10] IAEA, Board of Governors, 'The agency's accounts for 2009', Report of the Director General, GOV/2010/20, 13 Apr. 2010.

all agency activities in that country. This will be a huge cultural shift for the agency. Such a person might reside on the programme side of the matrix and be called a project officer (see figure 1).

In addition, the country officer would control access to the agency by outside organizations. This is not a problem if outside organizations do not coordinate their approaches and funding, but the agency should know what it is receiving and how projects interact.

CONCLUSIONS

The IAEA acknowledges that it would like to work as 'one house' and this has been a goal of senior management for some years. Structural obstacles have meant that there has been little progress towards this goal. A thoughtful reorganization of the IAEA along programme–matrix lines could go a long way towards reaching the 'one house' goal.

Re-creating the IAEA as 'one house' requires intentional and substantial management changes. These changes must modify the culture to the extent that technical standards and challenges—not historical loyalties and adherence to tradition and seniority—define staff positions.

If the IAEA can create an environment where innovative managers attract the best people to their programmes, the poorer managers will need to compete or be left behind. Similarly, if the main programme managers have to share resources and compete for the best brains among the staff, they will have far more incentive to change their programmes and offer new choices and challenges.

For the IAEA to be chosen to take on new mandates, such as verifying an FMCT, it needs to show willingness to adapt to new circumstances and apply all its resources efficiently to a problem. The IAEA was not chosen to verify the 1996 Comprehensive Nuclear-Test-Ban Treaty because it was too inflexible and would have tried to force new responsibilities into an inappropriate existing structure. In the case of the FMCT, under the current line structure the agency could be expected to create another FMCT-focused department with its own staff and resources. This is exactly the opposite of what needs to be done.

The failure to achieve 'one house' is not due to a lack of vision or a failure to recognize the need; it is caused by an obsolete and stagnant management structure. The IAEA needs to study other management models for high-tech organizations employing a variety of well-educated technical staff. By mimicking successful commercial and government organizations, it will also improve its ability to compete externally.

ABOUT THE AUTHOR

Robert E. Kelley (United States) is a former IAEA director and deputy leader of the Iraq Action Team. He is a veteran of over 35 years in the US Department of Energy nuclear weapons complex, most recently at Los Alamos National Laboratory.