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## Ethics and public integrity in space exploration<sup>☆</sup>

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### A B S T R A C T

This paper discusses the National Aeronautics and Space Administration's (NASA) work to support ethics and public integrity in human space exploration. Enterprise Risk Management (ERM) to protect an organization's reputation has become widespread in the private sector. Government ethics law and practice is integral to a government entity's ERM by managing public sector reputational risk. This activity has also increased on the international plane, as seen by the growth of ethics offices in UN organizations and public international financial institutions. Included in this area are assessments to ensure that public office is not used for private gain, and that external entities are not given inappropriate preferential treatment. NASA has applied rules supporting these precepts to its crew since NASA's inception. The increased focus on public sector ethics principles for human activity in space is important because of the international character of contemporary space exploration. This was anticipated by the 1998 Intergovernmental Agreement for the International Space Station (ISS), which requires a Code of Conduct for the Space Station Crew. Negotiations among the ISS Partners established agreed-upon ethics principles, now codified for the United States in regulations at 14 C.F.R. § 1214.403. Understanding these ethics precepts in an international context requires cross-cultural dialogue. Given NASA's long spaceflight experience, a valuable part of this dialogue is understanding NASA's implementation of these requirements. Accordingly, this paper will explain how NASA addresses these and related issues, including for human spaceflight and crew, as well as the development of U.S. Government ethics law which NASA follows as a U.S. federal agency. Interpreting how the U.S. experience relates constructively to international application involves parsing out which dimensions relate to government ethics requirements that the international partners have integrated into the ISS Crew Code of Conduct, and which relate to other areas of U.S. administrative law. It is also constructive to identify areas where national and/or cultural perspectives may differ. Another reason for heightened focus on ethics is the increasing regularity of long duration human spaceflight. In earlier days of spaceflight astronauts had little time for anything other than mission operations. The increase in inflight personal time and opportunity for personal communications heightens the importance to spacefaring nations of advising on ethics obligations in real time. Through individual and collective action, stakeholders in evolving and future government space exploration will be able to effectively address ethics compliance and reputational risk.

### 1. Introduction

To provide a framework for analysis, I will postulate that ethics and public integrity in space exploration are addressed, broadly speaking, in three ways:

- 1) Through specific ethics rules that apply, including standards agreed to by partner states to a cooperative venture, and each partnership state's government ethics requirements applying to their crew.
- 2) Through a continuing dialogue among spacefaring nations and other cooperating entities to address issues which have not yet been resolved in agreed upon standards.
- 3) By advising people directly involved in effecting spaceflight, including agency managers who make decisions about activities in space, and government crew members who go there.

I will touch on each of these facets from the vantage point of NASA's role in them.

### 2. Government ethics in history and the contemporary international community

This section introduces public sector ethics as a field with a rich place in history and on the world scene today.

Integrity in public service has ancient origins. In the Book of Exodus, the Hebrew leader Moses is urged by his father-in-law to retain those who are "of truth, hating unjust gain" as public officials [1]. In the thirteenth century, controversy ensued when the Mongol Emperor Kublai Khan appointed the great Yuan Dynasty executive Bolad to head the empire's Office of Agriculture while retaining Bolad's role as a senior censor. The Censorate was a bureau in ancient China conceived to root out corruption in the administrative service, so that a dual appointment as the head of a regular ministry and censor contravened established government conflict of interest principles [2]. While the appointment stuck, Bolad himself proved an innovator in fighting corruption by uncovering the excesses of the empire's finance minister [3]. In the subsequent Ming dynasty an independent Censorate thrived [4]. So too in the New World of the

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eighteenth century, the Constitution of the newly established United States forbid, as it still does, federal government officials and employees from accepting gifts or titles from a foreign nation without the consent of the United States' Congress [5]. Given the historical backdrop supporting integrity in public service, it is not surprising that integrity is one of NASA's core values [6].

Social forces similar to those underscoring the importance of government ethics can be observed through tools used in the contemporary private sector, where efforts to protect an organization's reputation are now widespread. Of course managing reputational risk is an important part of Enterprise Risk Management (ERM) in both private and public entities, where nurturing, maintaining and optimizing a culture of integrity plays a big role. Today, for example, econometric models also provide a way for companies to quantify the value of mitigating reputational risk based on cases where ethical breaches were publicized. These models include forecasting the fall in stock price, consequential loss of market capitalization, and other financial effects such as the cost of borrowing when an event implicating reputation occurs or reputation otherwise changes [7].

Quantitative methods that measure the value of mitigating reputational risk may not easily be applied to the public sector, where governance is executed through political and administrative processes rather than business decisions, and the relationship between the organization and markets is more abstract. It is, however, well understood that loss of public integrity can undermine important public objectives and jeopardize the completion of government projects. Accordingly, government organizations today must ensure that incidents which can undermine public integrity are identified and mitigated beforehand, and that this risk be properly managed to ensure enterprise objectives are achieved.

Public sector ethics programs that support the maintenance of public integrity enjoy an increasing focus among the community of states and within international organizations. The United Nations (UN) Convention Against Corruption, which entered into force on December 14, 2005, includes various government ethics provisions including obligations for state parties to prevent conflicts of interest [8], promote integrity [9], implement government codes of conduct [10], disclose corruption [11], and have systems for government officials to report personal financial interests [12]. The United Nations Ethics Office serving the UN's Global Secretariat was established in 2006 [13], and in the ensuing years other major UN entities including the United Nations Development Programme, United Nations Population Fund (UNFPA), United Nations International Children's Emergency Fund (UNICEF), and the United Nations High Commissioner for Refugees (UNHCR) established their own ethics offices [14]. The International Monetary Fund (IMF) had embarked on this path even earlier in 2000 [15]. These developments portend the importance of government ethics in today's public sector ERM.

### 3. U.S. government ethics and human space exploration

This section explains how U.S. government ethics law and human space exploration developed in tandem. Foreshadowing ethics practices that have now gained international attention, ethics programs in the United States Government have focused on addressing the acceptance of gifts or gratuities related to public service [16], preventing conflicts of interest [17], restricting outside employment and other activities that conflict with an individual's government job [18], restricting post-government employment that would provide former government employees with unfair access [19], and requiring certain officials and employees to disclose financial interests to maintain compliance and promote transparency [20].

The advancement of the systems that focused on these principles occurred very much in parallel with the emergence of U.S. human space exploration. In 1965, when Project Gemini and its crews of two were pioneering and advancing basic facets of spaceflight operations, President Lyndon Johnson issued Executive Order 11,222, concentrating for

the first time various federal government ethics requirements that had developed into a single authoritative document [21]. Some existing statutory restrictions including criminal prohibitions on bribery [22], former employees gaining unfair government access [23], conflicts of interest [24], and government employees being additionally paid for their official work by outside sources [25] were already in place, and had been improved and streamlined in 1962 [26]. However, Johnson's executive order was a milestone in managing public sector reputational risk at the enterprise level. Stated another way, Johnson's order advanced the transformation of the U.S. Government's approach to ethics to a system where risks were being actively addressed and mitigated as part of good governance, not just deterred through legal prohibitions.

In 1978, when NASA was transitioning from the Apollo program and the Skylab and Apollo-Soyuz missions that were derived from Apollo designs, the United States Government was further bolstering its ethics infrastructure so that the enterprise functions and standards that evolved from Johnson's executive order themselves became a statutory mandate. In 1978, following the Watergate scandal that caused President Nixon to resign, the U.S. Congress passed the Ethics in Government Act [27]. This law established an independent agency, the U.S. Office of Government Ethics, to centralize executive branch ethics policy [28].

In the context of space exploration, NASA has long applied ethics precepts covering U.S. Government employees to its astronauts, including ensuring that public office is not used for private gain and that external entities are not afforded preferential treatment. On October 26, 1978—coincidentally the same day the Ethics in Government Act became effective—NASA issued a public notice codifying by regulatory measures rules that specifically prevented personal mementoes taken in space by all Space Shuttle flight participants, including participants who were not U.S. Government employees, from being used for private gain or commercial purposes [29]. This was done to prepare for the Space Shuttle program in the wake of earlier controversies which brought negative attention to NASA's work, including an incident where the crew of Apollo 15—a 1971 mission to the Moon—had planned to profit by bringing stamps and other philatelic materials on the flight [30]. This regulation was recently revised for future NASA missions [31].

### 4. ISS ethics provisions

The regulation mentioned above is an example of the first of the three ways I believe we address ethics and public integrity in space exploration—through established rules, some which as above are domestic, and others which are international. A further example of this in the latter context is how government ethics gained a place in the governing framework of the International Space Station (ISS). Article 11(2) of the Agreement among the Government of Canada, Governments of the Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station (the Intergovernmental Agreement or IGA) [32] requires the partners to collectively develop and individually approve a “Code of Conduct for the Space Station crew.” The language of Article 11(2) does not explicitly require that government ethics requirements be included in the Code [33]. Significantly, however, ethics provisions were in fact included by mutual agreement of the parties in the ensuing multilateral negotiations through which the partner states forged the Code of Conduct for the ISS Crew [34]. This result reflects that an increased focus on public sector ethics principles for human activity in space is justified because of the international character of contemporary space exploration.

This Crew Code of Conduct has gained domestic legal effect through concerted national legal implementation by the ISS partners. It applies to all ISS crew [35], which Part I, subpart C(7) defines to be “any person approved for flight to the ISS, including both ISS expedition crew and visiting crew, beginning upon assignment to the crew for a specific and ending upon completion of the postflight activities related to the

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