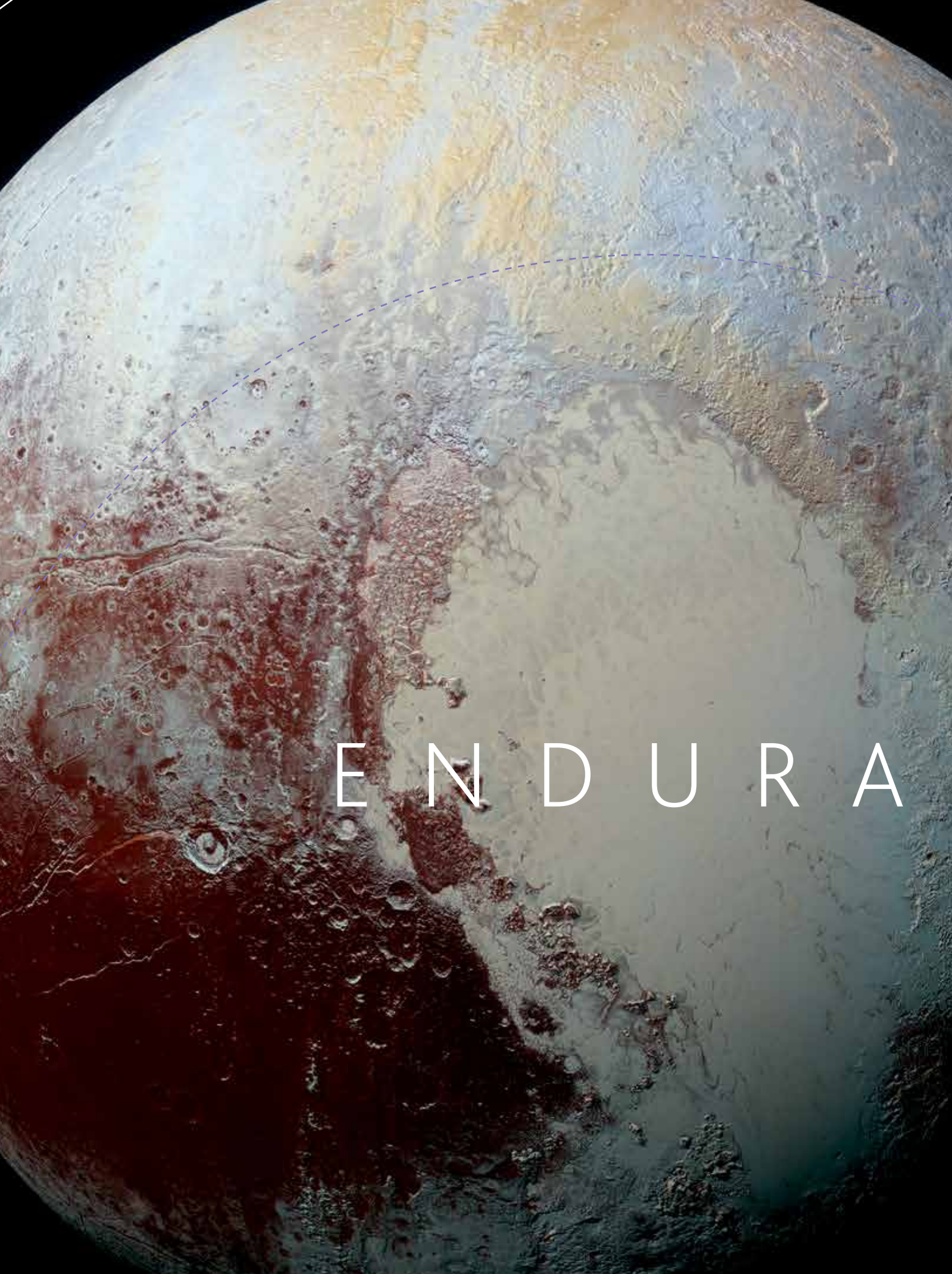
ENDURA

During long-term projects, project managers must look back and ahead to mitigate risks and talent gaps.

NCE TESTS

BY SANDRA SWANSON

Last July, NASA's New Horizons space probe zoomed in to capture the first close-up images of Pluto—the result of a remarkable 3-billion-mile (4.8-billion-kilometer), nine-year journey to the edge of the solar system. The U.S. space agency's mission was one-of-a-kind, but it relied on the same project management principles any marathon project needs to succeed.

Creating a project plan that will stand the test of time takes looking to the past—and far into the future—to identify and anticipate potential risks. Maintaining continuity and enthusiasm on the project team means being a coach and a cheerleader year after year. And managing the revolving door of stakeholders and vendors requires a communication plan that will work for the long haul.

But developing this discipline takes a special skill set. Project managers who have steered long-term projects from start to finish share their secrets for passing the project endurance test.

PHOTO COURTESY OF NASA

1 INSIST ON FULL INVOLVEMENT

While team members and stakeholders are likely to come and go, the critical project constant must be the requirement document, says Barbara Rusinko, senior vice president and manager of corporate engineering, procurement and construction functions at construction and civil engineering company Bechtel, Houston, Texas, USA.

"As time marches on and you want to change a design feature, if you don't know why engineers chose the original design, you are introducing risk," she says.

Managing risks from start to finish requires stakeholders and subject matter experts to stay involved each step of the way. Whether partners were involved in the past or will step up in the future, project managers need everyone in planning meetings to manage risks in the present.

"If you are missing a key stakeholder in that meeting, you can be blind to risks that might appear later," Ms. Rusinko says.

For example, when she helped oversee a US$8 billion, six-year project to create a liquid natural-gas plant that was completed in 2015, it was essential to have construction team members in early meetings to evaluate risks, even though they wouldn't be deployed to the job site for months, she says. The project team also made sure that initial risk planning involved workers who wouldn't appear on the job site for several years, including the workers who would turn on all of the plant's systems.

"Those are usually the last people to mobilize to the job, but some of the risks they would identify will influence how you do engineering," Ms. Rusinko says. "In a rush to get started, these folks are sometimes missed in those meetings."

It's also tempting to push some risk evaluations to the back burner to accommodate the demanding schedules of the busiest team members, she says. But that's a bad habit that can backfire. Each time teams agree to address certain risks at the next meeting, it increases the threat that next time never comes, Ms. Rusinko says.

"You need to sit down and talk about all risks," she says. "There could be a risk that might not be the highest dollar value—but if it happens, it can have a significant impact."

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—Barbara Rusinko, Bechtel, Houston, Texas, USA

2 CREATE CONTINUITY

Project managers must be prepared to replace experience and knowledge when team members move on after years on a project (see "The Next Atomic Age," page 38).

For instance, veteran project managers in Kiruna, Sweden are combatting potential brain drain with mentorship and knowledge transfer. In 2015, Kiruna launched a 17-year project to relocate the entire city of 23,000 because a neighboring mine was encroaching on the town. Since several of the project leaders are more than 60 years old, there's been a push to hire younger team members who can be groomed to take over if others retire, says Göran Cars, head of development at the Kiruna municipality.

"They need to be brought in now, and exposed to the processes and tough situations they will face," Mr. Cars says. "They don't have to take responsibility, but they should be aware of what they will need" if a project team member retires.

To mitigate the loss of knowledge or skills on the nine-year New Horizons mission, team members were cross-trained so more than one person understood how to develop commands for certain instruments, says Glen Fountain, program manager at Johns Hopkins Applied Physics Laboratory and project manager for the New Horizons mission, Washington, D.C., USA.

The team also created a longevity document, a record of all the knowledge from the initial designing and building of systems "so 10 years later, if we had someone that didn't know how something was put together exactly, they could go back and read that document," Mr. Fountain says.

"You need enough depth in the skill base so that no single individual is so critical that the loss of that person is going to be a catastrophe," he says. "There was always some concern that someone would be hit by the proverbial bus."

Project managers can also take steps to limit staff turnover, such as changing up tasks so that no position becomes mundane. For instance, Murray Duke, project management office director, AIG, Tokyo, Japan, recommends rotating project managers between projects on a program to keep things fresh and interesting—if that's something individual team members prefer. "Whatever strategy you choose needs to consider the unique personalities of the project team," he says.

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—Glen Fountain, Johns Hopkins Applied Physics Laboratory, Washington, D.C., USA

3 KEEP IT SIMPLE

When milestones are separated by months rather than weeks, breaking a project into digestible chunks can help build stakeholder support.

For instance, Mr. Duke recommends breaking the budget for a large initiative into pieces that have funds released over time. Having access to the full budget can create a false sense of financial security, he says. So he releases funds in phases, comparing project progress to the business case at each phase before additional funds are released.

"If implemented correctly, this can ensure that the funds for each stage are more manageable and any request for additional spends can be framed in the budget for that phase, rather than the budget of the overall project," he says. "Building on this, the change control governance can be tailored to look at financial triggers that are based on different criteria, instead of simply looking at the change against the overall budget."

Defining project phases and providing frequent progress reports can also help stakeholders understand what percentage of the project's value has been achieved, says Syed Zaidi, PMP, project manager for vehicle manufacturer Scania, Södertälje, Sweden.

This is especially important for long-term projects, as it can be difficult to sustain a sizable budget commitment over several years, he says. So he divides projects into steps that can be rolled out separately, releasing each piece as soon as possible.

"We went live with a pilot in one country within three years—to not only produce value as a first step, but also to make sure we learned from feedback as soon as possible," he says. "That strategy brings more resources into the project and reduces financial stress."

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—Syed Zaidi, PMP, Scania, Södertälje, Sweden

CASE STUDY

Threading the Needle

How NASA overcame a project crisis on its journey to Pluto.

Space-time waits for no man. When U.S. space agency NASA launched the New Horizons space probe, it had to manage its schedule according to the stars.

"When you're working on a planetary mission, the timing of everything is dependent on the clockwork of the universe," says Glen Fountain, program manager at Johns Hopkins Applied Physics Laboratory and project manager for the New Horizons mission, Washington, D.C., USA. "The schedule was one of the hardest constraints."

But as NASA prepared to send New Horizons to Pluto in January 2006, project managers had to resolve a crisis that threatened to add five years to the journey—and millions of U.S. dollars to the budget.

Members of the New Horizons team at the 2006 launch of the spacecraft at Kennedy Space Center, Cape Canaveral, Florida, USA

The team needed to launch the probe within a weeks-long window that closed before 28 January 2006 so that New Horizons' speed could be boosted by Jupiter's gravitational pull. Missing the launch window would have likely delayed the probe's approach to Pluto until 2020. Scientists worried that beyond 2020, Pluto would be too far from the sun, making its atmosphere too cold for the probe's equipment to function. If that happened, NASA would have to wait more than 200 years before Pluto would travel close enough to the sun to make another mission possible.

The critical launch window was threatened in August 2004 when the Department of Energy (DOE) told the project team that it wouldn't be

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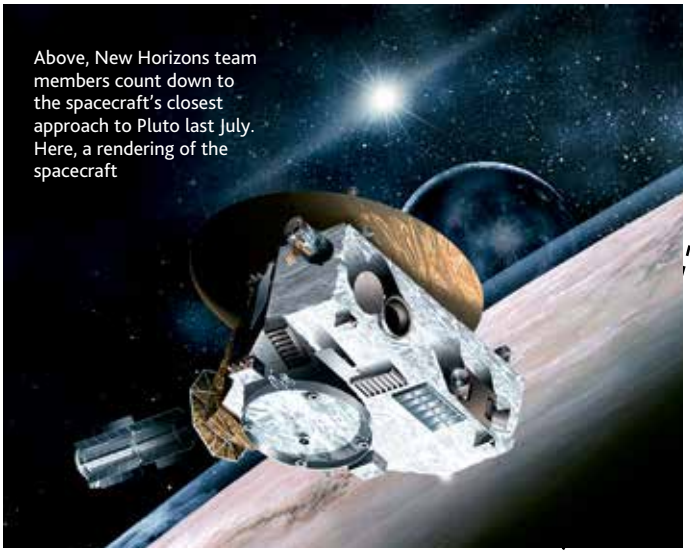
—Glen Fountain

PHOTOS COURTESY OF NASA

able to supply as many fuel modules as it had promised for the scheduled launch. And the DOE was the only source the New Horizon team could turn to for the mission's rare energy source, plutonium-238, Mr. Fountain says.

"We went into problem-solving immediately," he says. He asked the DOE how much power it could supply for the launch, then turned to the project team's mission systems engineer to determine whether it would be enough to safely operate a mission to Pluto. Within two weeks, the project team and the DOE had reached an agreement that would meet the team's schedule and the space probe's minimum power requirements—in part, thanks to having a strong risk management system in place, Mr. Fountain says.

"Because we worried about power consumption on the spacecraft and managed that well, that allowed us to handle a completely unexpected challenge," he says. "As in any significant technical endeavor, it is the combination of good processes and a talented team that allows a project to survive the challenges and succeed."



Above, New Horizons team members count down to the spacecraft's closest approach to Pluto last July. Here, a rendering of the spacecraft

CASE STUDY

A Moving Experience

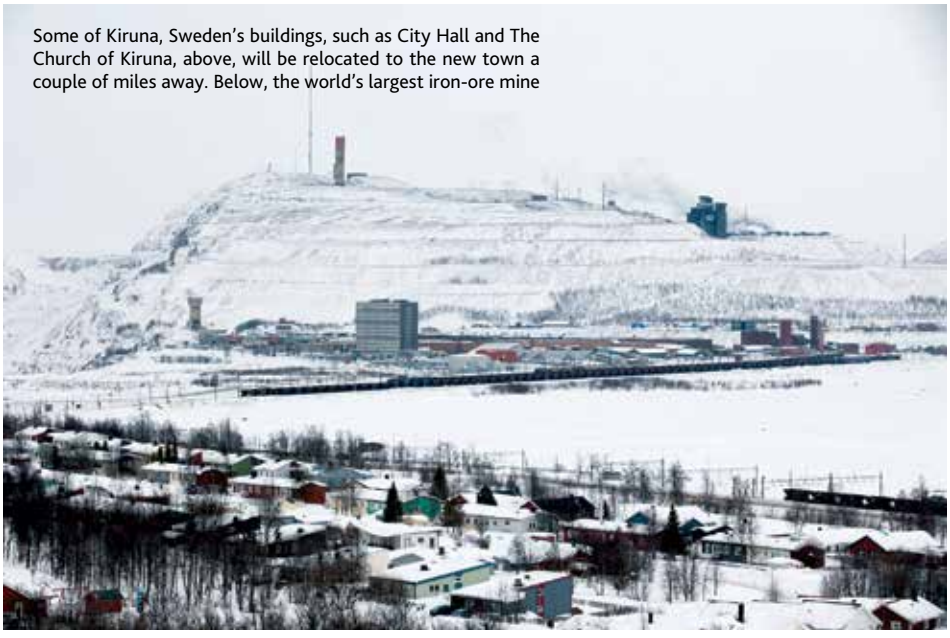
In Sweden, project managers take a people-first approach to relocating a town.

Moving an entire city only makes sense if the people who live there will follow. That's why the project team leading the relocation of a small Swedish town is making every move with its 23,000 residents in mind. Moving the town is necessary. Staying put would mean that the world's largest iron-ore mine would gradually swallow parts of Kiruna.

Although Kiruna, Sweden is being relocated just 2 miles (3.2 kilometers) down the road, project managers are determined to make the transition as smooth as possible. Comprehensive strategies to manage stakeholders and risk are at the core of a 17-year, €2.5 billion planning and construction project that's scheduled to be completed in 2023.

"You can't move a city without having the support—or at least acceptance—from citizens involved."

—Göran Cars, Kiruna municipality, Kiruna, Sweden



Some of Kiruna, Sweden's buildings, such as City Hall and The Church of Kiruna, above, will be relocated to the new town a couple of miles away. Below, the world's largest iron-ore mine

PHOTOS BY MELANIE STETSON FREEMAN/THE CHRISTIAN SCIENCE MONITOR VIA GETTY IMAGES

"You can't move a city without having support—or at least acceptance—from citizens involved," says Göran Cars, head of development for the Kiruna municipality.

From the start, the project team anticipated that residents and shop owners would have conflicting priorities and visions for the new town. The team solicited feedback by hosting small focus groups where everyone felt their opinions could be heard, rather than large public meetings where a vocal minority could dominate the discussion, Mr. Cars says.

"Rather than having a debate, we talked to people about what could be possible solutions that met their needs and requirements," he says. When a group expressed concerns, "we brought up those conflicts when we talked to the other groups. And they worked toward resolving it, with something that's not perfect but acceptable to all the groups."

For instance, the meetings helped project leaders determine that shop owners wouldn't move until libraries, schools and town halls already had been established, because creating a town core would convince residents to move—and establish ready customers for their shops, Mr. Cars says. Shops will be relocated simultaneously in 2019, so all start fresh on equal footing, he says.

"When we presented the plan, we had a lot of public support, which is extremely important with such a big project," he says. "If you have protests all the time, it's very hard to get investors in place."

The project team also took a sweeping approach to anticipate and mitigate risks. For example, Mr. Cars relied on meetings with colleagues who had completed large-scale projects in other Swedish cities for lessons learned that might trigger greater risk awareness for the Kiruna project. One major takeaway: Limit the risk of cost overruns by negotiating early with developers.

"I met person after person who said, 'We had a fantastic plan for this part of the city—and then developers said we can't do it. It isn't financially feasible,'" he says. "That was a disaster for their projects, of course."

To avoid a similar fate, Mr. Cars and his team showed rough design sketches to developers before they began negotiations with construction contractors to determine achievability. With construction in the early stages, the project plans are being displayed in more than a dozen locations throughout Kiruna.

"Right now we have support of local residents," says Mr. Cars. "It's wonderful to have that." **PM**