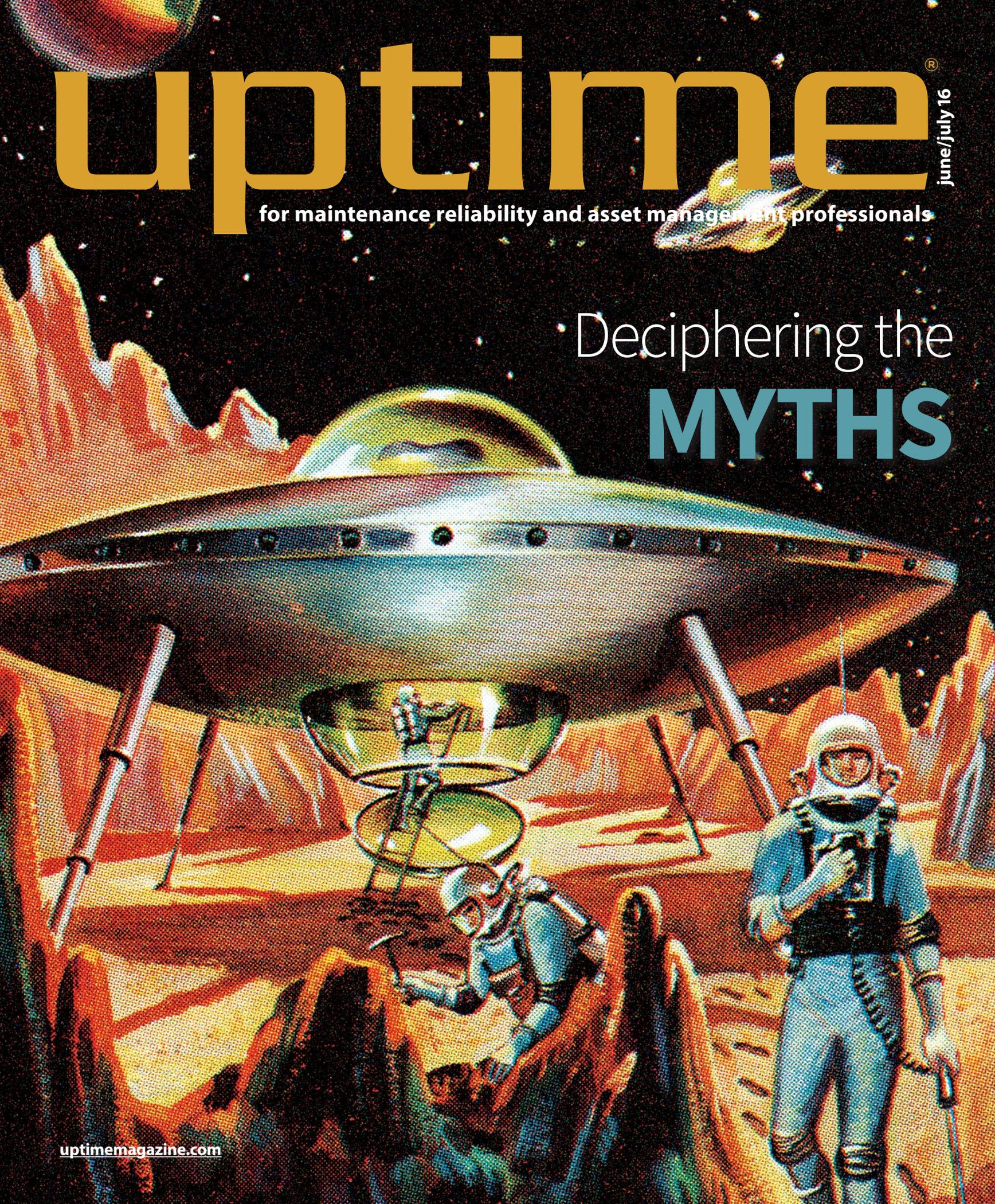


uptime[®]

for maintenance reliability and asset management professionals

june/july 16

Deciphering the
MYTHS





Certified Reliability Leader Workshops

The industry's most advanced thinking in reliability



70% of reliability improvement efforts fail to generate sustainable business success.

The CRL Workshop explores the **WHY** and **WHAT** of reliability, providing you the understanding so you can move from failed initiatives to successful ones.



Included in your registration

4-Day Workshop Pass

Uptime Elements Passport Series plus Travel Guide - **\$150 value**

30 - day free trial to the Uptime Elements Academy Learning Management System - **\$299 value**



BRING YOUR TEAM!

reliabilityleadership.com
239.333.2500 | 888.575.1245
crm@reliabilityweb.com



Even Data Centers Need

PPMM

OPTIMIZATION

by Dr. Klaus Blache

YOU NEED PM OPTIMIZATION IF:

- Your PM tasks add minimal or no value;
- There is insufficient wording or clarity on your PMs;
- Decisions are being made without sufficient information;
- You are performing the wrong kind of PM tasks;
- PM tasks cause as many problems as they fix due to lack of accessibility, modular replacement, visual controls, training, etc.;
- You can't get your predictive and condition-based maintenance tasks done because all you are doing are reactive repairs;
- PM tasks don't seem to be effective;
- PM intervals are too short or long.

PM optimization is a systematic process to get the best equipment reliability. This is done by identifying and improving on weaknesses in maintenance performance and frequencies. PM optimization is a process, a series of questions or a guiding decision matrix, that helps make your preventive maintenance (PM) more efficient and effective. It enables the optimization of resources, while instilling best practices.

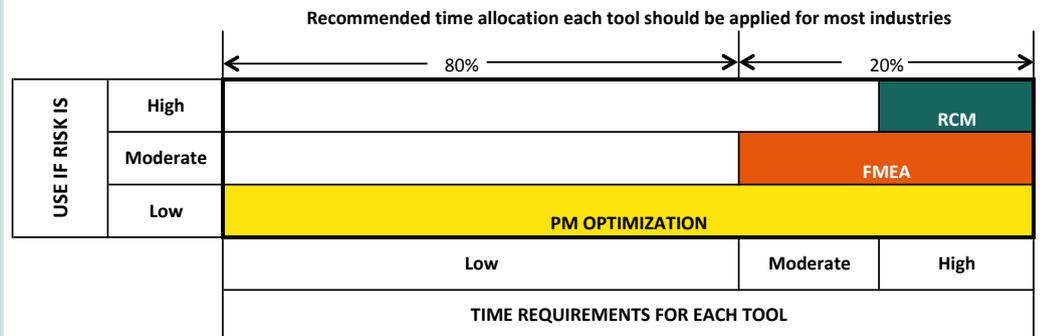


Figure 1: PM tasking improvement tools

Table 1 – Comparison of Five PM Optimization Studies

	1 John Schultz Industrial Equipment	2 Steve Turner Coal Mine	3 Steve Turner Coal Mine	4 Klaus Blache Data Center	5 Klaus Blache Data Center
Number of PM Tasks	20,000	964	>300	793	200
Results of PM Optimization:					
Eliminate the Task	8%	21%	8%	49.90%	24.00%
Use Task As Is	10%	38%	52.40%	14.80%	38.50%
Change Task to:					
PdM/Condition-Based	32%		13.00%	*	
Extend Task Intervals		23%	4.00%	*	
Reduce Task Intervals		6%	0.30%	*	
Add New Task		12%	7.70%	22.70%	
Change Role/Responsibility (Assign to Operator and Lubrication, Outsource Service, Reengineer, Further Analysis Needed)	47%		14.60%	12.60% ⁶	37.50%
	3% Other				
	100%	100%	100%	100%	100%

Sources

1. Moore, Ron. *Selecting the Right Manufacturing Improvement Tools: What Tool? When?* Fort Myers: Reliabilityweb.com, 2011, p. 251.
2. Turner, Steve. "PM Optimization Case Studies at Two Coal Mines." ReliabilityWeb.com download
3. Ibid
4. Blache, Klaus. "Data Center PM Optimization Study, 2014."
5. Blache, Klaus. "Data Center PM Optimization Study, 2015."
6. 12.60 percent also includes items marked with*.

You can do PM optimization as part of a comprehensive reliability-centered maintenance (RCM) implementation, a full or shortened version of a failure mode and effects analysis (FMEA), or by itself. The extensiveness of your analysis should be guided by the risk and severity of failure consequences.

However, with high internal competition for scarce resources, most organizations have small finite time available to do a full RCM and/or FMEA analysis. As such, the recommendation is to focus 80 percent of your time available for continuous improvement on PM optimization and the other 20 percent on FMEA and full RCM investigations.

RCM may be your guiding philosophy, but how many weeks or months are you willing to set aside for RCM and FMEA projects each year? If the risks and potential consequence of failure are high, as in the aerospace industry, you do it. But for most industries, it's a decision between reliability goals and bottom-line financial results.

Many of the maintenance tasks come from the original equipment manufacturer (OEM) and are often required to maintain warranty. Many others are added to respond to emergency repairs and avoid similar situations. A large number are still there only because they are being carried over from some past issue, reasoning, or justification that is no longer valid.

Table 1 compares the outcome of five PM optimization efforts from different industries. The first study is based on industrial equipment, the



The extensiveness of your analysis should be guided by the risk and severity of failure consequences



next two studies are from mines and the final two are from two different data centers.

The infrastructure of data centers (e.g., pumps, fans, cooling tower, transformers, compressors, air handlers, fire protection, filters, power supply, etc.) is just as ripe for improvements as most other industries. There may be some facilities that would not benefit much from PM optimization, but those have not been found as yet.

Although the data findings were collected in varying categories, the studies have been compiled to enable some comparisons. The reasons for the differences are the age of the equipment (e.g., just being commissioned versus being in use for a long time), type of industry, team member backgrounds and level of experience, focus of the optimization initiatives and so on. All these factors guided the failure modes, strategy discussions and decisions.

As the data findings show, PM optimization is a useful tool in all types of industries, such as

manufacturing, process, mining, utilities and yes, even data centers.

For those interested in data center focused reliability there is the "R&M Data Center BootCamp", which is at UT with one or more days at the Oak Ridge National Laboratory's Supercomputing Complex. <http://rmc.utk.edu/events/data-denter-boot-camp/>



Dr. Klaus Blache, CPE, RMIC, is the Director of the University of Tennessee Reliability and Maintainability Center and Research Professor in the College of Engineering. His most recent book,

"The Relativity of Continuous Improvement," was released December 2015 (www.reliabilityweb.com/bookstore). For more information on the Reliability and Maintainability Center at the University of Tennessee, visit www.mmc.utk.edu.

Online4US

ACM Asset Condition Management

Online Ultrasound & Vibration Monitoring



- Stand-alone system
- Modular and flexible
- Up to 32 measurement channels
- Data & machine status posting
- Easy, user-friendly set-up
- 4 condition indicators



Ultrasound Solutions

www.online4us.com

Produced by
names you trust



See and hear it
first at IMC



The International Maintenance Conference



The 31st International Maintenance Conference, is acknowledged as the leading maintenance, reliability and asset management conference in the world.

IMC is the conference that brings you presentations that you can't find anywhere else!



Hyatt Regency
Coconut Point Resort
Bonita Springs, Florida



888.575.1245 • 239.333.2500

crm@reliabilityweb.com • reliabilityweb.com