

SPECIAL REPORT Long Live DLP?

IMAGINE THAT YOU ARE SEATED in the boardroom at Coca-Cola's corporate headquarters. The lights dim and the branded opener to a new, high-profile training video flashes onto the projection screen. The slickly produced audio floods the room as your eyes register an unavoidable fact: The true red of Coca-Cola's logo is a shocking, garish orange.

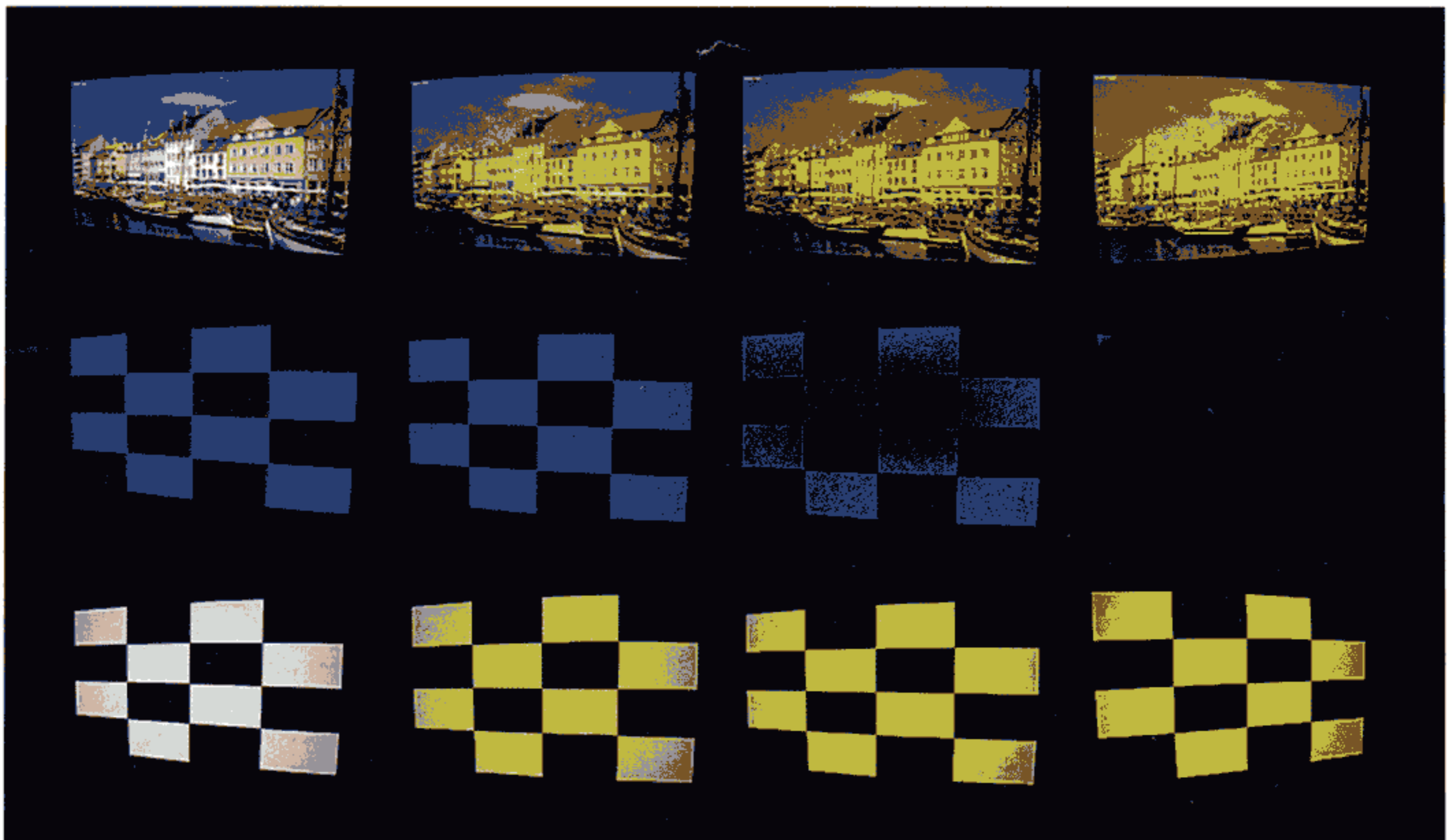
This could never happen, you say. Think again. According to a new study by Rochester Institute of Technology's Munsell Color Science Laboratory that measured the picture and color reliability of competing DLP and LCD projectors, this public-relations nightmare could be in your future—if you own an LCD projector.

I was briefed on the findings of this study at Texas Instruments' Picture Reliability Forum for analysts and journalists in Dallas on March 13. The data, gathered by Rick W. McCall and

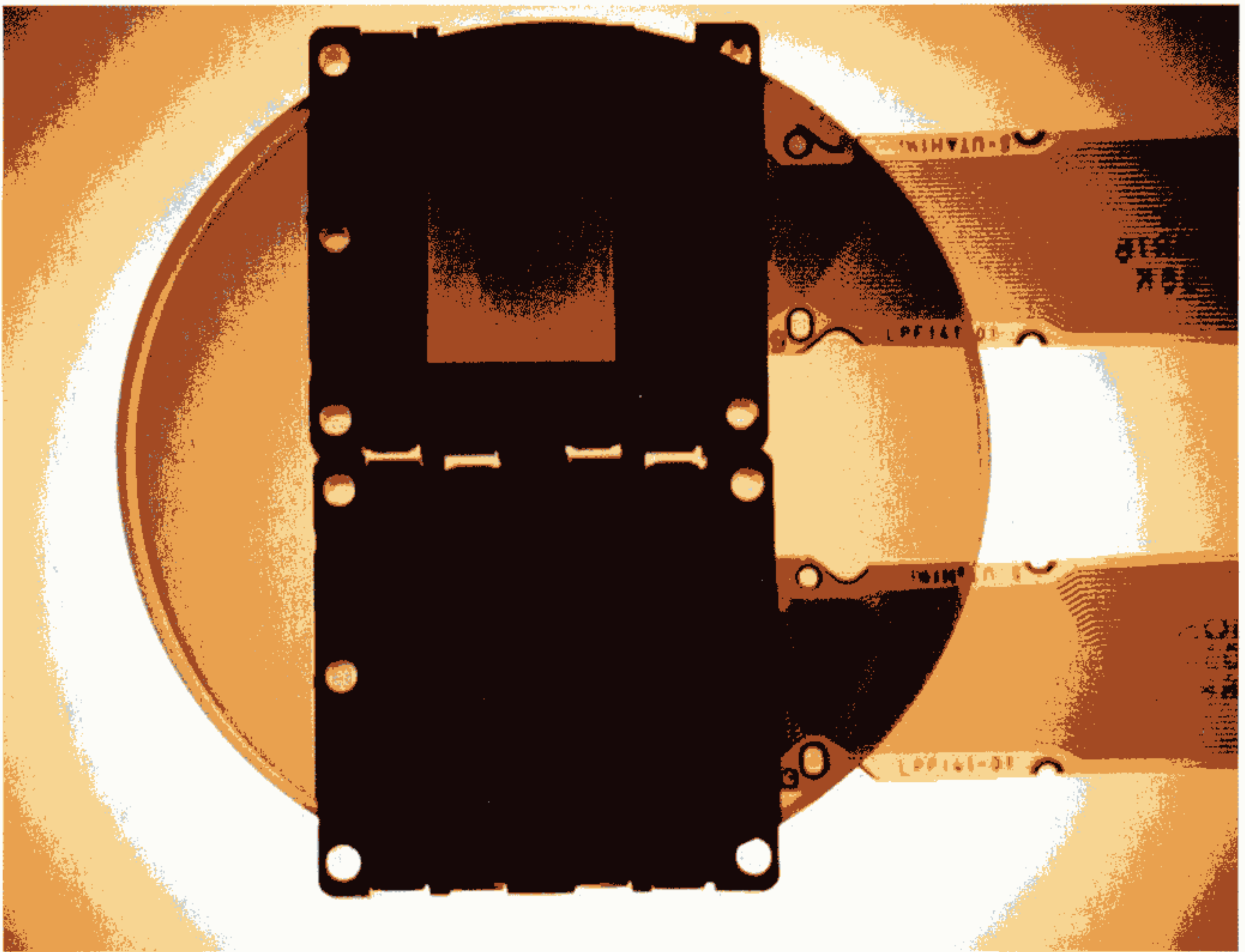
a team of color scientists at Munsell Lab and interpreted by TI, is very straightforward: The picture reliability of a Digital Micromirror Device on TI's DLP chip appears to be constant over the life of the projector, or about 4,000 hours worth of use. However, the performance, color and picture quality of every LCD projector in the study—five unnamed products from five unnamed manufacturers were tested in addition to two unnamed DLP projectors—showed marked degradation over time. This defect was unrecoverable even after

A new study about the reliability of color and picture quality in LCD and DLP projectors could change the course of front-projection technology. How will LCD projector manufacturers respond?

BY BETH MARCHANT



The frames above show the progressive color degradation on one of the five LCDs in the TI and RIT/Munsell Color Science Laboratory test after 24 hours (far left), 1,440 hours, 2,256 hours and 3,312 hours, respectively.



The LCDs' blue channel polarizers were hardest hit by the test's 24/7 intense light. The degradation resulted in large blemishes on screen.

the lamps on the LCD projectors burned out and were replaced. Uniformity and brightness remained constant on the LCD projectors, but color and picture quality were severely compromised in each LCD unit. "Anecdotal evidence had long suggested that LCD picture quality degrades over time," says Lars Yoder,

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the manager of DLP business products. "But we needed empirical evidence of this. It was time to conduct a side-by-side study."

TI maintains that picture reliability should be expected for the lifetime of a projector. Three of the LCD units tested failed within well under 3,000 hours, or the equivalent of three years. If you invest in an LCD projector, the study suggests, you will have to replace it

long before you may want to. LCD projectors are generally less expensive than DLP models, usually by several hundred dollars. TI concludes from the data, however, that DLP is the sounder economic choice because you never have to replace a DLP projector—at least not before five years. (Could this also explain why it is so hard to find a decent long-term warranty on most projectors currently on the market?)

Market-research firm Pacific Media Associates estimates that the average use of a corporate boardroom projector is about 75 hours per month. Although those projectors are not run continuously, as the projectors in this study were, 4,000 hours works out to a little less than five years. If you expect to replace your LCD projector within five years, then you won't be concerned by this study. But if budget constraints require you to hang on to your equipment much longer—and if you, like most people, have borrowed that same projector to watch movies at home on the weekends—then you could have some seriously

degraded images in your professional future.

After presenting the findings, Yoder led us into a boardroom configured with four different projectors and corresponding screens on each wall to show us the results first hand. One way to describe the yellowing effect on the three projected images from the LCD projec-

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tors is to compare it to the way that time ravages decades-old color photographs stowed away in a shoebox: The projected images appeared faded, aged and far removed from the vibrant originals. The LCDs' blue polarizer panels looked even worse: The panels subjected to the tests showed darkened and eroded middle sections, clearly visible upon inspection. This results in a panel that transmits light in a less-than-constant manner. TI explained it as a breakdown of polymers and dyes caused by exposure to the high-intensity light.

Study Methodology

All units in the picture-reliability study were put in a darkened lab at Munsell—maintained at an ambient room temperature of 25 degrees Celsius—and run continuously for the duration of the experiment. Munsell engineers collected parametric data on luminance, contrast,

uniformity, and color chromaticity for white, red, green and blue at periodic intervals. Most important, all of the units got their input signals from the very same source material. Four LCD and both DLP projectors tested had XGA resolution. One LCD projector had a resolution of 16:9.

There are two fundamental caveats to this study that must be acknowledged. The first, and most obvious, is that although the engineers at the Munsell Color Science Lab gathered the data independently at their own facility, they carried out the study under the direction of Texas Instruments, notably Michael R. Douglass, a long-time and distinguished member of TI's technical staff. Douglass was also responsible for the evaluation and interpretation of the results.

The second caveat is that this study raises many additional questions. For example, what percentage of users will actually put their LCD projectors through the incredible paces that this experiment did? What happens if the projectors are turned off for periods of time, as they typically are during normal use? Will they degrade less quickly? And do the findings also apply to LCD flat-panel displays, which are often chosen for 24/7 public venues (see "Flat-Panel Frenzy," page 16)? One can infer that, because of the low-wattage nature of LCD panels, they wouldn't show the problem as quickly or as dramatically as the projectors did. But could your LCD display be in jeopardy eventually?

The study, while significant, does not answer these important questions. Many more studies, some likely initiated by prominent LCD manufacturers in the months ahead, must and inevitably will follow. ■

