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Code Pipeline

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Why are there Plumbing Product Standards?

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Imagine yourself in Baltimore, Maryland, at 10:48 in the morning of Sunday, February 7, 1904 standing in front of the John E. Hurst & Company building that stood on the south side of German (now Redwood) Street between Hopkins Place and Liberty Street.

One of the most important lessons about standardization was about to occur. It was the great Philadelphia fire and conflagration of 1904. There had been other big fires or conflagrations in the past, but none of them was quite like the 1904 fire because of the high winds and the many wooden structures that had been built so closely together. The scope, magnitude and rapid spread of this fire led the Baltimore Fire Department to very quickly call for mutual aid assistance from a variety of cities and states. Response was excellent given the circumstances, but operations became difficult because of the different sizes and shapes of fire hose couplings, some of which simply would not fit any hydrants or other fire departments hose threads. The fire departments also learned how quickly a conflagration could spread through combustible buildings in a downtown district which featured many close combustible exposures.

According to newspaper reports after the fire, an alarm went immediately from the automatic box attached to the outside wall of the building. This brought response from Baltimore's Engine 15, a steam pumper and hose wagon (both pulled by two-horse hitch), Truck Company 2, the Fire Insurance Patrol and District Chief Levin H. Burkhardt.

Responding firemen started attacking the basement fire, but within seven minutes it spread rapidly up through an unenclosed well-hole in the 6-story brick building, bursting explosively from the top floor and involving nearby buildings which had unprotected window openings. For the next thirty hours, this conflagration burned completely out of control, destroying 155 acres (eighty city blocks), and 2,500 buildings, putting 50,000 people out of work, and causing an estimated financial loss of fifty million dollars in 1904.

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As the fire progressed through the city, desperate calls for assistance were sent to Washington, Philadelphia, New York and other municipalities. Each of those cities sent horse-drawn apparatus on railroad freight cars.

Apparatus and manpower from Philadelphia and Wilmington, Delaware, arrived in about two hours after being called. The New York train made a record run in a little over four hours. Washington, which first heard about the fire at 11:40 a.m., sent two engine companies, Nos. 3 and 6, by a special Baltimore and Ohio train which arrived about 1:30 in the afternoon. (Running time of this train was reported as 38 minutes just two minutes slower than the record train run for this distance.) Later Washington sent Engines 2 and 8 and additional manpower which totaled seventy-five men including Chief Engineer William T. Belt. Other cities sending apparatus and manpower included Chester, York, Altoona, Harrisburg, and Phoenixville, Pennsylvania; Annapolis, Sparrows Point, Relay and St. Denis, Maryland; and Atlantic City, New Jersey.

Total manpower at the fire included 1,700 firemen of which 400 were unattached volunteers. When they first arrived, out-of-town fire companies were delayed in attacking the fire partly because of the general confusion, and also because the many sizes and shapes of fire hose couplings just would not fit the hydrants. Because of the incompatible hydrant hose threads, about forty fire companies went to the dock area and were able to draft from the waterfront. Others fire companies used barrels and wooden horse troughs set against hydrant openings, with the hydrant pouring into the barrels and troughs so their pumpers could draft water from the miniature reservoirs that were formed. What generally stunned the fire departments and other persons who saw the fire was the rapid spread from building to building and intense heat development even within fire-resistive structures. Weather conditions were normal with low winter temperatures but a strong wind blowing from 20 to 30 mph. The fire started in the heart of the business section, but because of wind direction and general lack of exposure protection, it spread easily from building to building.

Hose streams from fire apparatus were practically useless against the intense heat. An NFPA report issued a few months later had this statement:

In contradiction to ordinary fires in individual buildings which usually spread vertically from floor to floor, this conflagration was essentially a horizontal fire as regards its attack and progress in each building. As a rule, every story was ignited simultaneously through the exterior windows and the fire swept across the building and out at the opposite side. Under these circumstances, the protection of floor openings will avail but little if the windows are unprotected.

In a desperate attempt to halt the violent spread of fire, city officials authorized the dynamiting of structures. Two fire officers were designated by the mayor to select buildings that were to be demolished by explosives. Local building contractors were selected to carry out the demolition. Explosive charges were placed inside of buildings at the base of supporting columns and detonated by an electric

"hot box." These tactics, however, did not stop the spread of the conflagration since even the largest charges of explosives failed to flatten or crumble a building. The heat of the fire was estimated at 2,200 to 2,500 degrees Fahrenheit and a shower of hot embers and radiant heat contributed to the spread of the fire.

Typical of newspaper descriptions of this famous conflagration is the paragraph below, taken from the *Leslie's Weekly Newspaper* February 18, 1904 issue:

[...]The night was black with the smoke and red with the flames as far as the eye could see. The furious gale tossed millions of great flaming cinders into the air. The panorama changed rapidly. Suddenly a great office structure would become brilliant, the light glaring through the windows as though every electric bulb and every gas jet in the building had been lighted at once. Then the dense, billowing veils of black smoke would hide it for a minute. Shortly a crashing sound would rise clear and distinct above the clamor and din and roar that were everywhere; and great leaping flags of flame would burst through the veil of the smoke, and float exultantly, it seemed, from the very top of the vast kettle of fire. In a few minutes more the building would be dark, and you would know that only the crumbling skeleton of it remained. You had seen a "fireproof" building burned out in half an hour! Then a new flame in a new quarter would arrest your attention, or the terrific heat would drive you from your post. The conflagration finally, died to controllable size when it reached Jones Falls, a 50-foot wide canal, in eastern Baltimore. Here about forty pieces of apparatus finally made an effective stop. One of the amazing features of this conflagration was that no one was killed, although forty firemen were injured. Much hose and minor pieces of fire equipment were damaged but only one piece of apparatus was lost, Engine 15's pumper.

It is well known that the Baltimore conflagration focused national attention on the need for standardized fire hose couplings and screw threads. This fire demonstrated the need for standardization of fire hose threads because of a lack of standard fire-hose couplings. The fire also provided a renewed emphasis on standardization. When firefighters from Washington and as far away as New York arrived to help douse the fire, few of their hoses fit the hydrants. The National Bureau of Standards (now known as the National Institute of Standards and Technologies or NIST) had been established a couple of years prior to the fire to standardize units of measurement for commerce and industry. At the time of the fire the National Bureau of Standards had been working on standardizing the measurement for a U.S. gallon for uniformity of weights and measures and they were working on units of measurement for electricity and calibrating electrical metering devices for the new and emerging electrical power generation industry. Members of the National Bureau of Standards collected more than 600 sizes and variations of fire-hose couplings in an investigation and, after the Baltimore fire, the NBS

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participated in the selection and development of a national standard for fire hose threads. Since then many standards writing organizations have been established. There are several of these standard writing associations that are developing standards for plumbing products. The organizations are:

- The American Society of Sanitary Engineering (ASSE)
- The American Society of Mechanical Engineers (ASME)
- The American Society of Testing & Materials (ASTM)
- The National Sanitation Foundation (NSF)
- The Canadian Standards Association (CSA)
- The International Association of Plumbing & Mechanical Officials (IAPMO)

Recently the American Society of Plumbing Engineers started developing plumbing system design standards, but these standards are limited to system designs and they do not address product standards.

There are numerous standards writing organizations with lots of working groups and task groups developing standards for the industry and that can be a bit overwhelming if you try to keep up with them all. I have been very active with the American Society of Sanitary Engineering serving on dozens of plumbing product standard working groups and as a member of the ASSE Seal control board and as a member of the main plumbing product standard committee. For about the last ten years I have been attending many of the plumbing product standards meeting for the above organizations mostly paying my own way. I have found there is basically very little input from design professionals and people who are not manufacturers or representatives of manufacturers at the standards meetings. I have often been the lone non manufacturing person on a working group and this puts me in the minority. There are code consultants, lab representatives, manufacturers and occasionally a retired engineer that do a great job of keeping the consensus standard development process working. However, none of these standards are worth the paper they are printed on if they are not submitted to and accepted by the local or model code that is enforced by a given jurisdiction.

Within the townships, villages, cities, counties, states or governmental jurisdictions throughout the United States and Canada there exists two model plumbing codes and a wide range of local or regional plumbing codes. Some codes are home grown by a city like Chicago or Boston or a state like Illinois or Wisconsin and they have been developed locally over the years with local code change processes. Other states and jurisdictions have elected to follow an easier and less expensive process of adopting model codes instead of spending the money to develop and maintain their own codes.

The inspectors in each these jurisdictions are required to enforce the plumbing code and these inspectors must follow the text in the code. The plumbing code is an extension of the laws of the jurisdictions after the jurisdiction adopts the plumbing code as part of their local ordinances.

This makes the job of the inspector easy if the code covers the subject in detail and with mandatory language. If a code uses vague and non mandatory language or permits a lot of inspector interpretations, then it can create confusion, for engineers, contractors and manufacturers because of inconsistent and unequal enforcement between jurisdictions.

The people on the standard working groups or task groups strive to develop language that will provide a minimum level of health, safety and performance requirements for a given product. I find it awkward and frustrating when the chairman of a standard committee or work group is employed by the manufacturer requesting the standard to be written. It seems the comments on the negative ballots always get deemed “non-persuasive” because it could affect that manufacturer’s ability to pass the test or it could cost more for manufacturing a better product. In a recent standard committee where the chairman was a paid representative of the manufacturer that was requesting the standard, the chairman drafted an outline standard with tests that were so easy that if the device was not even installed on the test stand during the test it could pass the test. I sent in a negative ballot pointing out these deficiencies and suggesting a series of tests that were realistic and in line with the intended application for the product. The procedures for developing standards require the chairman to address every negative comment on a given ballot. The response to my comment was simply “non-persuasive” without any other explanation. I’m pretty sure if the consultant was not working for the manufacturer he would have agreed with me. But on this day, I didn’t persuade the chairman because the tests I proposed would have probably made it harder for his client’s product to pass the test. I felt like the guy in the fable who said “I don’t see the emperor’s new clothes” I have experienced this same attitude in another plumbing product working group where the chairman was working on behalf of a manufacturer and trying to push a product through the meat grinder as fast as possible so they can start making widgets. After being involved in plumbing product standards development for about ten years now I see a need to have a staff person for the standards organization or someone other than the manufacturer requesting the standard to serve as the chairman of the standard working group or task force to serve as chairman. At a recent standards committee meeting in Cincinnati, Ohio this issue came up and a representative from a testing laboratory volunteered to take on the chairman’s position. I feel that was a good thing for the industry for him to step up and take the chairmanship position. I hope to see more non-manufacturers serving as chairman.

Typically design engineers, design professionals and members of the public do not get paid or reimbursed for expenses to be at the standard development meetings so it is understandable to see mostly manufacturers in attendance. In the end, I see a need for a neutral chairman or someone other than the manufacturer that is seeking the development of the standard serving as chairman.

I have seen a lot of new technology being developed for products that do not meet the basic intent and health and safety principles in the model plumbing codes. The

manufacturers of these new products are pushing forward with the development of new standards with their consultants leading the charge through the standard development process. They will most likely get their standard developed and bring them to the model codes for acceptance. The real test will be is the standard for the new product something the model codes will accept. There can be a problem since there is only two minutes of testimony and one minute of rebuttal testimony allowed at the plumbing code hearings when a new standard for a new product is proposed for acceptance in the codes. That is not very much time to explain how a new widget works and it is not enough time to allow an opponent to discuss the potential and inherent problems with a new product. If the people on the plumbing code committee do not get the standard and read and understand it, it is possible that the standard could get accepted without the code committee understanding what they are accepting. It seems that some code committee members are only concerned with was the standard developed in a consensus process. They need to step back and look at the health and safety aspects also.

After a standard is accepted and becomes part of the plumbing code it has the force of law when it has been adopted by ordinance by the jurisdiction. Every referenced standard then becomes part of the plumbing code by reference.

Inspectors must interpret and enforce code language and the referenced standards in the plumbing code. For new products, inspectors can also approve the use or installation of new products or materials in their jurisdictions. Most code officials do not have the facilities for testing these products; nor do they always have the funds to have them tested by independent laboratories. As a result, many problems face a manufacturer who wishes to introduce a new or improved product without a product standard. Some jurisdictions will accept the product if it has been tested by two or three recognized laboratories. Some will accept the test of individual laboratories to which manufacturers send their products. Some will not accept the product without years of tested proof if there is no standard.

The nature of some new products is such that only time testing under many environmental conditions can prove adequate capabilities of a product. Consequently, the introduction of a new or improved product can become a very time-consuming and expensive proposition because the manufacturer must send personal representatives to each locality to convey information of the product's characteristics and capabilities for performing its intended function. Introducing a new product in this country is very expensive these days. If a standard does not exist and testing is not performed or a sales engineer is not out promoting a product, the manufacturer may be limited in production or may have to develop many special models acceptable to various local jurisdictions; a course of action which reflects increased cost to the manufacturer and, ultimately, to the consumer. The development of consensus standards assists the approval process for inspection authorities who are responsible for reliability and safety in plumbing systems. This is why we have plumbing product standards.°

Pharmaceuticals in Water

By: Abby Schmeling

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Information taken from an article titled "NSF

Discusses Recent AP Report on Pharmaceuticals in Water and Next Steps"

According to a recent Associated Press report, small amounts of several different pharmaceuticals have been found in drinking water. This led to an investigation by the AP National Investigation team which included the review of hundreds of scientific reports and federal drinking water databases, environmental study sites and treatment plants were visited and over 200 officials were interviewed. Water providers in all of the fifty states were surveyed, including the nation's largest cities.

Due to this recent questioning, NSF has decided to work with other organizations in order to investigate the problem and create a solution. Currently, NSF is working with government agencies, wastewater and drinking water utility officials, product manufacturers and public health experts to create product standards, testing and certification services so drinking water meets quality needs.

The NSF's Joint Committee was held on March 20, 2008 and resulted in task groups getting put together so further research can begin on the status of pharmaceuticals in water. These groups will be examining the health effects, treatment options and possible requirements to be set in place for drinking water because of this situation. Federal and state legislation that requires the testing and treatment for possible contaminants in tap water is already in place.

A large majority of public and private water meets these drinking water safety standards. Due to these recent reports, however, additional legislation on the topic is under consideration. At this point, home water treatment systems are not certified to reduce pharmaceuticals, but they can protect against contaminants such as: arsenic, lead and cysts.



Please visit www.nsf.org where new information is available to educate and offer guidance on this topic.°

New PMG Program Releases Product Listing

From: ICC eNews

ICC Evaluation Service, Inc. (ICC-ES) issued its first ten listings for plumbing, mechanical and fuel gas (PMG) products. The ICC-ES PMG Listing Program provide evidence for manufacturers, building departments and consumers that approved products meet requirements in codes and standards.

"ICC-ES is a building department's most preferred and trusted evaluation service," said ICC-ES Director of Listing Programs Bernie Soesilo. "Many listing programs only verify that products meet standards requirements. The ICC-ES PMG Listing Program is unique because it's the only program that checks products against codes *and* standards, making it much more valuable to code officials."

Ducts, heating and cooling pipes, hood and ventilation equipment, and shower pan liners are among the products listed in the first round of ICC-ES PMG testing. Products are evaluated to meet the requirements of the *International Plumbing, Mechanical, Residential and Fuel Gas Codes* as well as the *Uniform Plumbing and Mechanical Codes*. Companies that received listings are W. A. Call Mfg. Co., Inc.; ACOME Corporation; Giles Enterprises, Inc.; Laticrete International, Inc.; Uponor North America; Clean Check, Inc.; Watts Radiant, Inc.; Ace Duraflo Systems; Uponor Rohrsysteme GmbH; and Titeflex Corporation/Gastite Division.

"We offer manufacturers quick turn-around times, very competitive pricing and wider recognition for our listings," said Soesilo.

Manufacturers pursuing listings under the ICC-ES PMG Listing Program can expect to pay up to 20 percent less than services provided by other listing agencies. For more information or to view the listings, visit icc-es-pmg.org or call (800) 423-6587, ext. LIST (5478).

A nonprofit, public-benefit corporation, ICC-ES does technical evaluations of building products, components, methods and materials. ICC-ES evaluation reports and the new listing programs for plumbing, mechanical and gas products provide evidence that products and systems meet requirements in codes and standards. ICC-ES is a subsidiary of the International Code Council.

The International Code Council, a membership association dedicated to building safety and fire prevention, develops the codes used to construct residential and commercial buildings, including homes and schools. Most U.S. cities, counties and states choose the International Codes, building safety codes developed by the International Code Council.°

Hospital Fined Over Patient Scalding

Oxford's John Radcliffe Hospital has been fined 8,000 British pounds after an elderly woman was badly scalded. Kathleen Byrne, 80, had to spend six extra weeks at the Headington hospital after both of her feet were badly scalded because a bath she was using did not have a thermostat controlling the water temperature.

Elaine Strachan-Hall, the director of nursing and clinical leadership for the Oxford Radcliffe Hospitals NHS Trust, admitted on behalf of the trust failing to ensure the safety of a patient at the hospital under the Health and Safety at Work Act. Oxford Magistrates' Court was told the 80-year-old was deemed capable of bathing herself by nursing staff but was scalded because the bath she used did not have a thermostatic mixing valve.

Health and Safety Executive inspector Matthew Lee, prosecuting, said: "It appears she turned on the tap, became aware that the water was too hot, tried to turn away from the tap and that caused her to fall backwards into the water."

The court heard that of the hospital's 33 baths, four had not been fitted with thermostatic valves, but the trust had been unable to find out why. John Mitchell, defending, said the trust had apologized to the patient and her family after the accident. He added: "The trust has carried out a wide-ranging investigation, it has identified the shortcomings and it has learned from what it discovered."

The magistrates fined the trust 8,000 British pounds and ordered to pay over 2,000 pounds in costs, 500 pounds of compensation.°

Department of Justice Issues Notices to Adopt New ADA Standards

Department of Justice Issues Notices to Adopt New ADA Standards Text: On June 17, the U.S. Department of Justice (DOJ) issued proposals to adopt new design standards for facilities under the Americans with Disabilities Act (ADA) based on revised guidelines previously issued by the Board.

Under the ADA, DOJ is responsible for maintaining standards for new construction and alterations that are consistent with the Board's guidelines. DOJ's standards apply to the construction and alteration of all facilities covered by the ADA except transportation facilities, which are subject to standards maintained by the Department of Transportation (DOT). The new standards would apply to state and local government facilities subject to title II of the ADA and to places of public accommodation and commercial facilities covered by title III of the law.

DOJ issued separate notices under each title. The notices

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also address issues relating to the application of the new standards, including effective dates. Through these proposals, DOJ is also revisiting or supplementing other sections of its regulations, which have changed little since their original publication in 1991. New or revised provisions are proposed concerning removal of barriers in existing facilities, accommodation of service animals, maintenance of accessible features, policies and practices governing various services, including hotel reservations, ticket sales and accessible seating, and provision of auxiliary aids, services, and effective communication, including captioning, narrative description, and video interpreting services.

The notices, which highlight specific issues in these and other areas where input from the public is sought, are available through the online edition of the Federal Register. Comments were due by August 18, 2008. DOJ plans to hold a public hearing on the notices during the comment period in Washington, D.C. For further information, contact DOJ at (202) 307-0663 (v/TTY) or visit the website at www.ada.gov.

Current ADA and ABA Standards DOJ will need to follow-up with a finalized notice after the comment period. In the interim, its existing ADA standards are to be followed until the new standards take effect as established in the final notice. Updated ADA standards issued by DOT are in effect for transportation facilities. In addition, most Federal facilities, including postal facilities, are subject to similar standards adopted by the General Services Administration and the U.S. Postal Service under the Architectural Barriers Act (ABA). Military facilities and federally funded housing remain subject to the Uniform Federal Accessibility Standards (UFAS) pending the adoption of new standards by the Department of Defense and the Department of Housing and Urban Development. Once these agencies and DOJ implement updated standards, a consistent level of access will be specified for all facilities covered by the ADA or the ABA. Additional information, including links to all relevant regulations and standards, is available on the Board's website.°

Standards for ADA Facilities

Transportation	Update DOT Standards
State & Local Government (except transportation)	Original ADA Standards or UFAS
Places of Public Accommodation & Commercial Facilities	Original ADA Standards

Standards for ABA (Federal) Facilities

Military & Housing	UFAS
Postal	Updated USPS Standards
All Other	Updated GSA Standards

Code Council Testifies Before Congress

From: ICC eNews



Pictured above: Rick Weiland during the Congressional meeting.

Code Council CEO Rick Weiland told the Congressional committee that compliance with energy efficiency codes could be better achieved with financial support for code officials. “Without strong compliance, even the most positive code provisions have limited value,” he said. Testifying last week before the House Committee on Energy and Commerce Subcommittee on Energy and Air Quality, Code Council

CEO Rick Weiland said the Council supports increasing energy efficiency in the built environment. Weiland told the Committee that compliance with energy efficiency codes could be better achieved with financial support for code officials, America's First Preventers.

The House of Representatives approved and sent to the Senate the Community Building Code Administration Grant Act, legislation that would provide funding to local building departments to support code adoption and enforcement.

“Without strong compliance, even the most positive code provisions have limited value,” Weiland said. “This is one area where a federal role is absolutely appropriate and critical to our overall effectiveness.” Weiland also cited the National Green Building Standard (NGBS), co-developed with the National Association of Home Builders, as another way the organization is supporting energy efficiency. He explained that Code Council Governmental members will consider approximately 100 proposed changes to the International Energy Conservation Code during the Final Action Hearings September 17-23 in Minneapolis.

“We are always ready to work with the Federal agencies,” Weiland added. “We are now coordinating our SMARTcode efforts to automate code checking, including the energy code, through Building Information Modeling. This new technology will help agencies to better and more efficiently meet their own energy and environmental mandates from the Congress and the President.”°

Whole-House WaterSense Specifications

By: Abby Schmeling

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Information take from Contractor.mag article "EPA To Create Whole-House WaterSense Program" by Robert P. Mader

As of July, the United States Environmental Protection Agency created WaterSense standards to be used by homebuilders and developers. This is known as the Water-Efficient Single-Family New Home Specification and will be used to reduce the amount of water used both inside and outside of new homes. As a result, it is hoped that these specifications will create infrastructure savings for communities. Any single-family homes or townhouses to be constructed that are three stories or less are to follow these standards.

Each year, about 1.5 million new homes are built in the United States. This results in over 120 million homes where seventy percent of the water usage is indoor use and the remaining 30 percent is outdoor.

The WaterSense program has been designed to change the majority of home building so that there is an increase in water use efficiency. The builders will inform homeowners on the proper use and maintenance of water-consuming appliances.

Several changes would be made to the home water use system. For instance, a pressure regulating valve would be used downstream from the water meter to control water pressure at a maximum of 60 psi. The toilets in these homes would have to be WaterSense-labeled, as would the bathroom faucets.

Although there are not currently specifications for showerheads, the agency is in the stages developing them. The showers must have valves, however, that comply with ASSE 1016 for ASME A112.18/CSA B125.1 and have heads with a design that protects from scalding and thermal shock.

Other products requiring specifications including: dishwashers, clothes washers, evaporative air conditioners, water softeners, and drinking water filtration systems. All specifications are written with the goal of reducing the amount of water that goes down the drain.

As for the outdoors, irrigation systems would be regulated and there would be a ban on ornamental water features. This means features such as fountains, ponds and waterfalls, since they do not serve a specific purpose.°



Upcoming Events:

HARDI Fall Convention

October 25-28

Phoenix, AZ

www.hardinet.org

A-D North American Plbg/PVF Meeting

October 26-29

Dallas, TX

www.adhg.com

Greenbuild International Conference & Exposition

November 19-21

Boston, MA

www.greenbuildexpo.com

Significant Code Changes: Venting of Regulators and Vent Piping

Source: ICC eNews

Venting provisions for pressure regulators in the International Fuel Gas Code have been clarified to require that the regulator be vented directly to the outdoors. Regulators that have vent ports have sometimes been installed in buildings without a vent line piped to allow venting fuel gas to be exhausted to the outdoors. The language for venting regulators has been clarified to require fuel gas pressure regulators with vent connections to be piped to the outdoors.°

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