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Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas

NEMA

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION ■ 2101 L STREET, N.W., WASHINGTON, D.C. 20037

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Foreword

In early January 1981, several member companies of the NEMA Transformer Section indicated a strong desire to reduce, through whatever practical means possible, the number of accidents involving very small children coming into contact with the active elements of padmounted transformers located in public areas. These accidents, while statistically low in number per year, are usually disfiguring and can result in death.

In February 1981, the Power Equipment Division Executive Committee established the Task Force on Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas. The Executive Committee charged the Task Force to develop a safety label which would warn small children away from an open padmount and simultaneously elicit the attention of an adult to contact the owner of the padmount for the purpose of removing the hazard. Secondly, the Task Force was instructed to develop a standard to accompany the label which would define its scope, content, appearance, and construction.

Over a period of 14 months, the Task Force pursued liaison with manufacturers and user groups in order to obtain acceptance of the safety label concept while label development was underway. The resulting pictorial, "Mr. Ouch", was developed from several designs and was psychologically tested in two phases. In the fall of 1981, 16 possible pictorials were tested in Chicago, Illinois and San Antonio, Texas among equal numbers of black, Hispanic, and white children 2½ to 6½ years old. Phase 1 testing indicated no significance in geographical considerations in regards to the perceptual attitudes of the children. The best four pictorials of Phase 1 testing were redesigned and tested again in January 1982 among equal numbers of black, Hispanic, and white children aged 2½ to 6½ in Chicago, Illinois. In Phase II testing, the "Mr. Ouch" pictorial scored very high in the two major desirable label attributes—the depiction of an immediate hazard and the elicitation of a safe response from the child to avoid the hazard.

The psychological testing was conducted by the George R. Frerich Associates Testing Organization of Chicago, Illinois. Graphic design was provided by Agnew Moyer Smith Inc., Pittsburgh, Pennsylvania.

NEMA has exclusive rights for the management of the "Mr. Ouch" pictorial. Rights may be obtained for the use of the pictorial from the National Electrical Manufacturers Association, Suite 300, Room 318, 2101 L Street, NW., Washington, DC 20037.

The members of the Task Force on Safety Labels for Padmounted Switchgear and Transformers Sited In Public Areas at the time of the approval of this Standard were:

Chairman
John F. Gormley
Westinghouse Electric Corporation

Secretary
John D. Hopkins
National Electrical Manufacturers Association

R. E. Bennett - General Electric Company
G. D. Coulter - General Electric Company
C. C. Dixon - R. E. Uptegraff Manufacturing Company
C. P. Kappeler - Central Moloney Transformer Division
G. W. Mayall - McGraw-Edison Company
F. D. Myers - A. B. Chance Company
N. M. Neagle - Consultant
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R. Ratica - Westinghouse Electric Corporation
K. Ross - Emerson Electric Company

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SAFETY LABELS FOR PADMOUNTED SWITCHGEAR AND TRANSFORMERS SITED IN PUBLIC AREAS

Scope

These labels are for use on padmounted Switchgear and Transformers sited in public areas such as utility easements adjacent to residential properties, shopping centers, schools, etc. They may also be used for such equipment sited in utility or industrial properties which are not normally accessible to the general public.

Purpose

These labels are intended to identify the padmounted equipment as potentially hazardous to anyone who comes in contact with their contents. The pictorials are designed to be meaningful to children and the illiterate, but with supportive wording expected to elicit a safe response from an adult.

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Section 1
MATERIAL

1.1 The labels shall be durable and made of weather resistant material.

NEMA Standard 9-15-1982.

1.2 Adhesive mounted labels shall be such that removal is impossible except by defacing, covering or destroying them. These labels shall meet the requirements of UL969-1980, *Marking and Labeling Systems.*[1]

NEMA Standard 9-15-1982.

1.3 Labels mounted by means of mechanical fasteners shall be used only if the removal of the mechanical fasteners leaves the cabinet with no openings through which foreign objects such as sticks, rods or wires might be inserted to contact live components. These labels shall meet the following requirements of UL969-1980:[2]

Requirement	Reference (of UL969)
Legibility test	Table 3.1
Defacement test	Table 3.1
Humidity test	Paragraph 7.3
Temperature test	Paragraph 7.4
Ultraviolet light test	Paragraph 7.5

NEMA Standard 9-15-1982.

Section 2
MAINTENANCE

It is desirable that the safety label remain legible for the service life of the padmounted equipment to which it is attached. Renewal of the safety label may be required during normal maintenance.

Authorized Engineering Information 9-15-1982.

[1]This standard is available from Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, Illinois 60062.

[2] UL969-1980 is written for adhesively mounted labels, however, some requirements are appropriate for labels mounted with mechanical fasteners. These latter requirements have been extracted for incorporation in this standard.

Authorized Engineering Information 9-15-1982.

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Section 3
FORMAT

3.1 The color of the warning signal word field shall be orange and the color of the danger signal word field shall be red. All label colors as depicted in Figures 1 through 4 shall conform to the following Munsell Notations:

Black	N - 2.0 or lower
Orange	5.0 YR 6.0/15
Red	7.5 R 4.0/14
White	N - 9.0 or higher

NEMA Standard 9-15-1982.

3.2 The safety labels in Figures 1 and 2 shall be standard and shall be 4.5 inches, ±0.25 inches (11.43 cm, ±0.64 cm) wide and 8.0 inches, ±0.5 inches (20.32 cm, ±1.25 cm) long[3]. The warning label (Figure 1) shall be affixed to the outside of the padmounted equipment. The danger label (Figure 2) shall be affixed to the inside of the padmounted equipment.

NEMA Standard 9-15-1982.

3.3 As an option, bilingual labels such as Figures 3 and 4 shall be furnished when specified. These labels shall be 10.6 inches, −0.0 inches + 1.0 inches (26.92 cm, −0.0 cm + 2.54 cm) wide with the height being variable to accommodate the bilingual message.

Authorized Engineering Information 9-15-1982.

3.4 It may be desirable that the owners of the padmounted equipment be identified with more information than "immediately call the electric power and light company". To this end, the owners of the padmounted equipment may place their name, company name and/or telephone number on or immediately adjacent to the area "the electric power and light company". The preceding standard messages shall not be covered by the substitution and, if not printed on the NEMA label, the material used to convey the ownership of the padmounted equipment shall meet the material requirements of this standard.

Authorized Engineering Information 9-15-1982.

Section 4
LOCATION

4.1 The outside warning label(s) (Figures 1 or 3) shall be mounted as close as practical to the equipment door while providing maximum visibility.

NEMA Standard 9-15-1982.

4.2 The inside danger label (Figures 2 or 4) shall be mounted as to be readily visible whenever the equipment door is open.

NEMA Standard 9-15-1982.

[3] A ¼ inch white border is intended to surround the label (signal word panel and black border) on all four sides.

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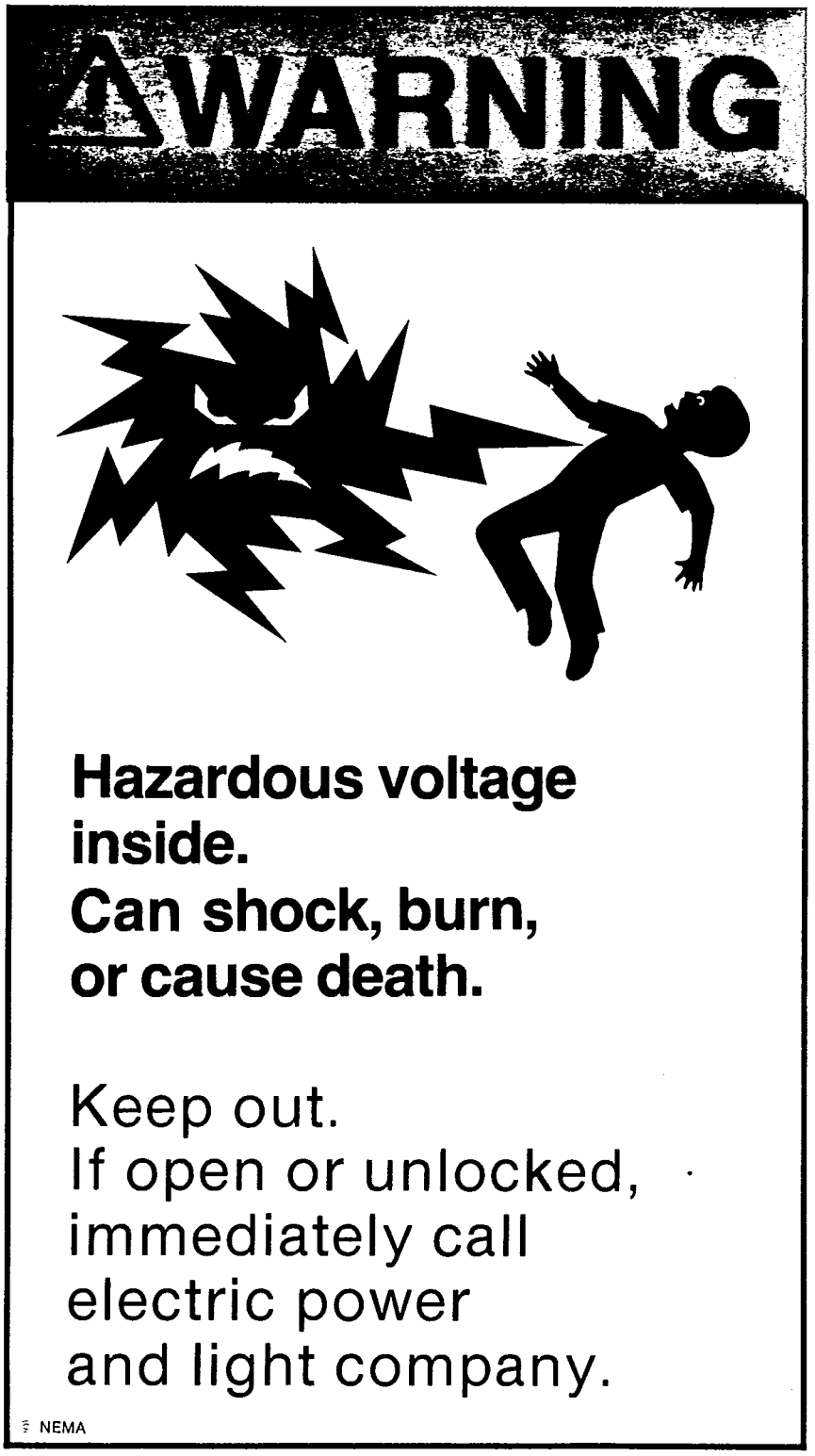

Figure 1

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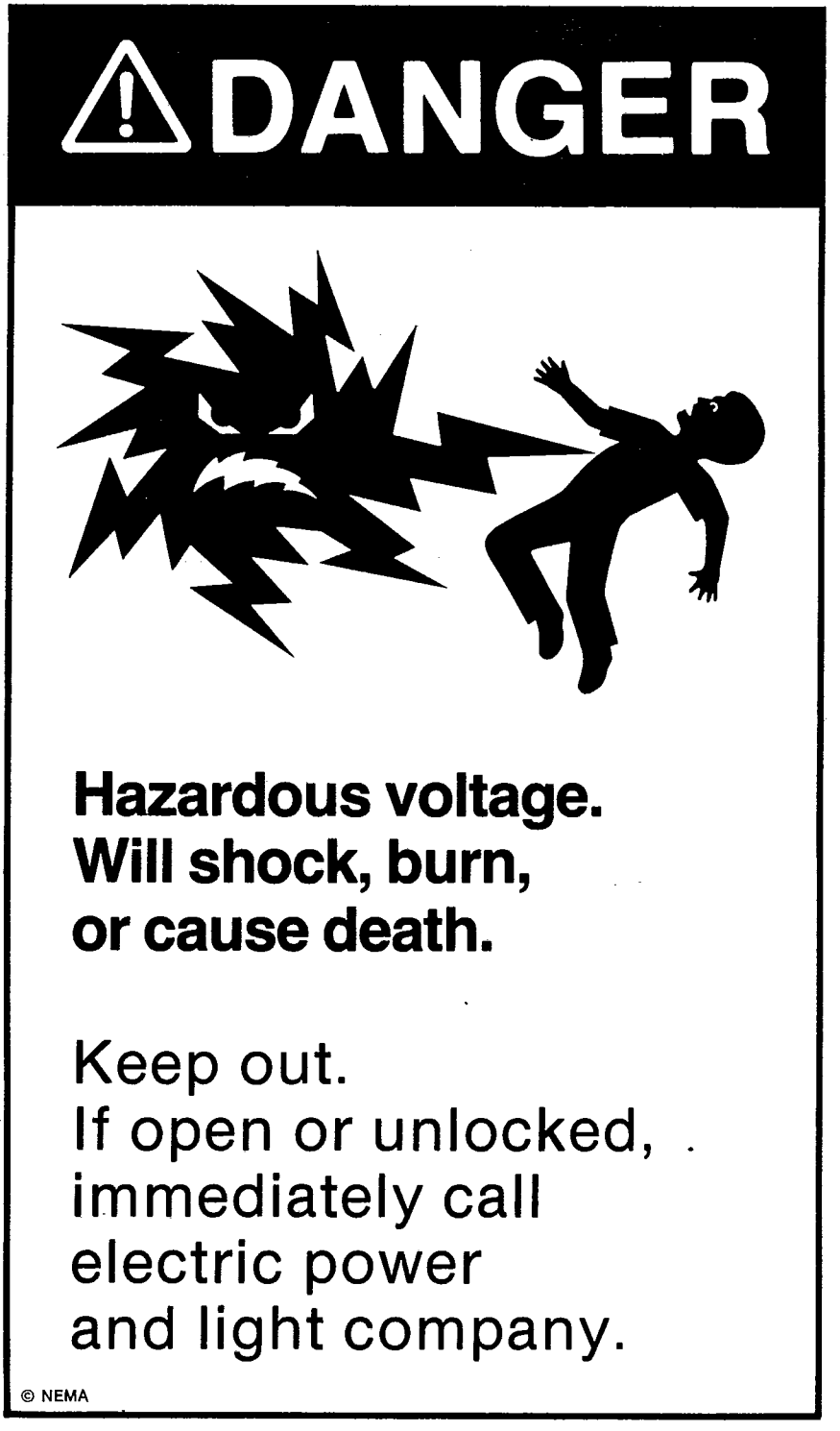

Figure 2

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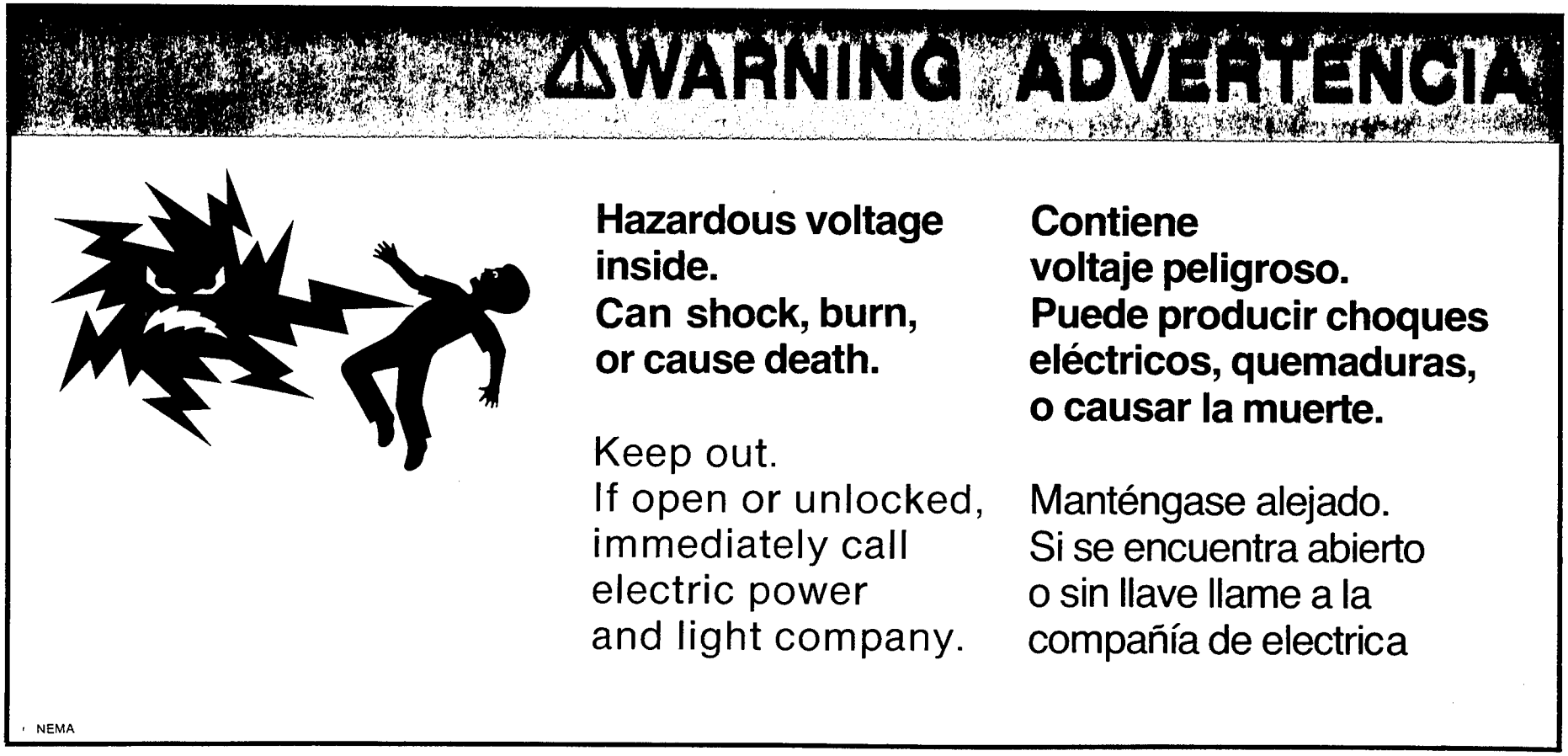

Figure 3

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⚠DANGER PELIGRO



**Hazardous voltage.
Will shock, burn,
or cause death.**

Keep out.
If open or unlocked,
immediately call
electric power
and light company.

**Voltaje peligroso.
Producirá choques
eléctricos, quemaduras,
o causará la muerte.**

Manténgase alejado.
Si se encuentra abierto
o sin llave llame a la
compañía de electrica

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Figure 4

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NEMA STANDARDIZATION

The purpose of NEMA Standards, their classification and status are set forth in certain clauses of the NEMA Bylaws, which are quoted below:

Purpose of Standards

National Electrical Manufacturers Association Standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist the purchaser in selecting and obtaining the proper product for its particular need. Existence of a National Electrical Manufacturers Association Standard does not in any respect preclude any member or nonmember from manufacturing or selling products not conforming to the standard.

(Bylaw—Art. V, Sec. 1)

Definition of a Standard

A standard of the National Electrical Manufacturers Association defines a product, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, rating, testing, and the service for which they are designed.

(Bylaw—Art. V, Sec. 2, Subsection A)

Dimensions

Where dimensions are given for interchangeability purposes, alternate dimensions satisfying the other provisions of the standards publication may be capable of otherwise equivalent performance.

(NEMA Policy Memorandum 84-2, dated June 7, 1984)

Classes of Standards

National Electrical Manufacturers Association Standards are of two classes:

1. NEMA Standard, which relates to a product commercially standardized and subject to repetitive manufacture, which standard has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon;
2. Suggested Standard for Future Design, which may not have been regularly applied to a commercial product, but which suggests a sound engineering approach to future development, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote thereon.

(Bylaw—Art. V, Sec. 2, Subsection B)

Authorized Engineering Information

Authorized Engineering Information consists of explanatory data and other engineering information of an informative character not falling within the classification of NEMA Standard or Suggested Standard for Future Design.

(Bylaw—Art. V, Sec. 6, 1st Sentence)

Official Standards Proposal

An Official Standards Proposal is an official draft of a proposed standard which is formally recommended to an outside organization(s) for consideration, comment and/or approval.

(Bylaw—Art. V, Sec. 4, Subsection A)

Identification of Status

Standards in NEMA Standards Publications are identified in the foreword or following each standard as "NEMA Standard" or "Suggested Standard for Future Design." These indicate the status of the standard. These words are followed by a date which indicates when the standard was adopted in its present form by the Association.

The material identified as "Authorized Engineering Information" and "Official Standards Proposal" is designated similarly.

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Electrical Equipment Group
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