INTERNATIONAL STANDARD 4031

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Information interchange — Representation of local time differentials

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4031 was developed by Technical Committee ISO/TC 97, *Computers and information processing*, and was circulated to the member bodies in May 1976.

It has been approved by the member bodies of the following countries :

Australia	Ireland	South Africa, Rep. of
Belgium	Italy	Sweden
Brazil	Japan	Switzerland
Canada	Mexico	Turkey
Czechoslovakia	New Zealand	U.S.A.
France	Philippines	
Hungary	Romania	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Germany, F.R.
United Kingdom

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AMENDMENT SLIP

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Information interchange — Representation of local time differentials

MODIFICATION TO FOREWORD *(Inside front cover)*

The responsibility of this International Standard has now been transferred to Technical Committee ISO/TC 154. "ISO/TC 154" therefore replaces "ISO/TC 97" at the 10th line of the Foreword.

Information interchange — Representation of local time differentials

0 INTRODUCTION

Many applications require that clock time be expressed in a form that can be used to satisfy both local and international interchange requirements. A time differential factor (TDF) is a means of facilitating information interchange by relating local time expressions to the Co-ordinated Universal Time (UTC).

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a standard means for representing local time differentials to facilitate interchange of data among data systems. Specifically, it is intended to :

a) reduce the time required to record and/or format local time expressions, relate them to the Co-ordinated Universal Time and transmit them;

b) improve clarity and accuracy of interchange;

c) minimize the amount of human intervention required for communicating time expressions;

d) reduce costs.

This International Standard does not prescribe file sequences, storage media, programming languages, or other features of information processing to be used in its implementation.

The use of this International Standard to represent local time differentials does not ensure that the representation is accurate.

2 REFERENCES

This International Standard is designed to be used in conjunction with the following International Standards when representing data-time groups :

a) ISO 2014, *Writing of calendar dates in all-numeric form;*

b) ISO 2711, *Information processing interchange — Representation of ordinal dates;*

c) ISO 3307, *Information interchange — Representations of time of the day.*

ISO 3307 provides for the representation of local time and Co-ordinated Universal Time, to which this International Standard directly relates. Accordingly, users of this International Standard should also apply the provisions of ISO 3307.

3 REPRESENTATION OF A LOCAL TIME DIFFERENTIAL FACTOR (TDF)

The TDF expresses the difference in hours and minutes between local time and the Co-ordinated Universal Time (UTC) as defined in ISO 3307. It is represented by a four-digit number preceded by a plus (+) or minus (−) sign, indicating the number of hours and minutes that local time differs from the Co-ordinated Universal Time.

The TDF for the Co-ordinated Universal Time (UTC) is represented as +0000. Local times throughout the world vary from the UTC by as much as −1200 hours (west of the Greenwich Meridian) and by as much as +1300 hours (east of the Greenwich Meridian).

The TDF immediately follows the low-order (extreme right-hand) time element of the 24-hour clock expression.

4 EXAMPLES

a) The following example represents a local time of 2 hours 9 minutes and 23 seconds past noon in the U.S. Eastern Standard Time Zone (five hours different from the UTC and west of the Greenwich Meridian).

	Representation	
	Without separators	With separators
Local time with the time differential factor	140923−0500	14:09:23−05:00

b) The following example represents a local time of 2 hours, 9 minutes and 23 seconds past noon in Calcutta, India (five and one-half hours different from the UTC and east of the Greenwich Meridian).

	Representation	
	Without separators	With separators
Local time with the time differential factor	140923+0530	14:09:23+05:30

The convention (i.e. algorithm) for using this data element in arithmetic conversions from and to Co-ordinated Universal Time is as follows :

– when converting from local time to Co-ordinated Universal Time, algebraically subtract the TDF from the local time;

– when converting from Co-ordinated Universal Time to local time, algebraically add the TDF to Co-ordinated Universal Time.

Adjust for a change in date, where applicable, using base 24 mathematical logic.