OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

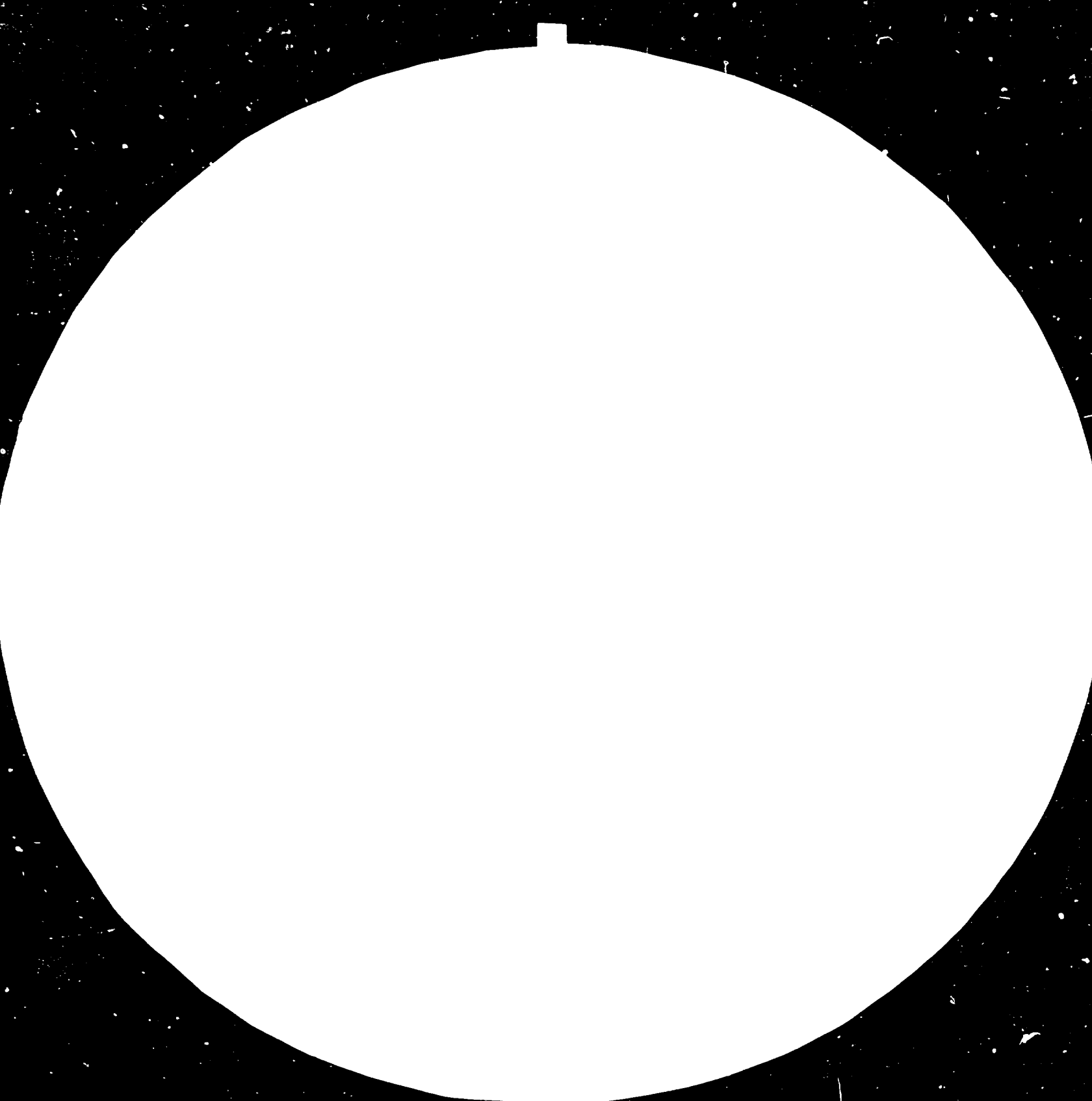
FAIR USE POLICY

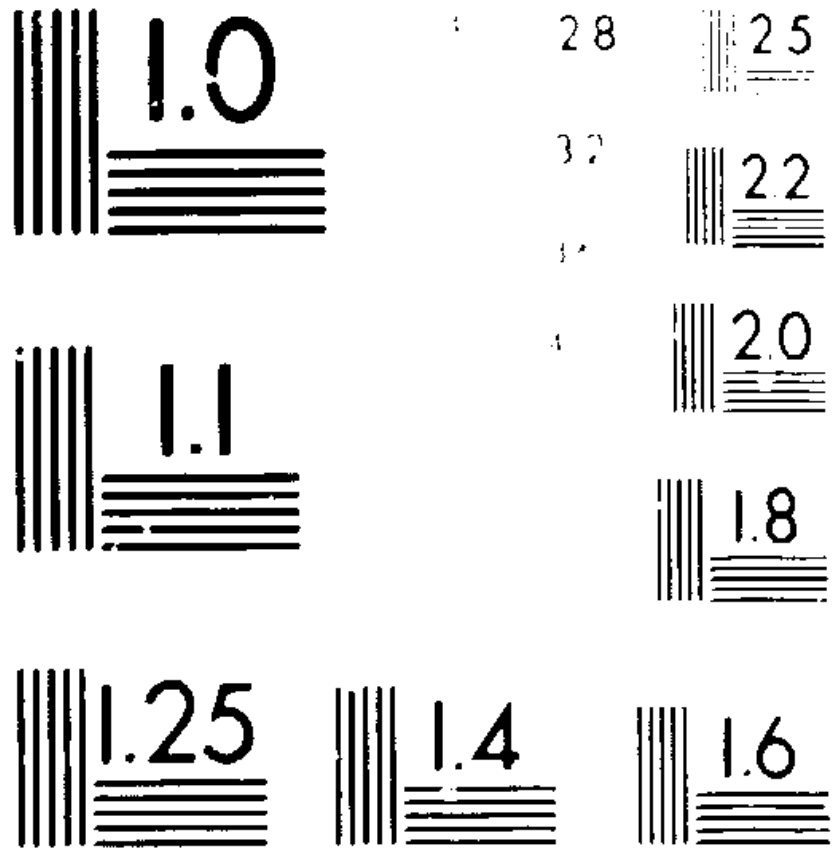
CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org





13562

Distr.
LIMITED

ID/WG.420/5
16 March 1984

ENGLISH

United Nations Industrial Development Organization

Interregional Workshop on the Promotion of
Welding Technology in Developing Countries

Tiruchirapalli, India, 30 January - 4 February 1984

INFORMATION MANAGEMENT AND DISSEMINATION*

by

M. Balasubramanian and B. Pullat**

* The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. Mention of firm names and commercial products does not imply the endorsement of UNIDO.
This document has been reproduced without formal editing.

** Senior Development Engineers, Welding Research Institute, India.

V.84-83441

1.0 INTRODUCTION

Welding, the art of metal joining plays a vital role in the field of fabrication. Its involvement ranges from joining of microwires for an electronic circuit to the fabrication of nuclear vessels. Welding Research Institute (WRI), a National Centre for R&D efforts in the field of Welding Technology, is actively engaged in carrying out both fundamental and applied research. The Institute has attached great importance to knowledge dissemination and human resource development and it has emerged as a centre for both, as both have good influence on and can be vital factors in enhancing the level of development. The Institute receives as many as 32 journals and publications covering welding and its allied areas. Documents from the International Institute of Welding are also received regularly.

WRI has a fullfledged documentation wing which makes every effort to disseminate the accumulated information over the years, and the latest information on the recent developments that are taking place all over the world.

In the process of dissemination of the welding information, WRI has effectively designed, developed and implemented a computerised information storage and retrieval system called the WELD-IN-SEARCH. This system, a path to the treasure of welding information, gives easy access to the hitherto developments in welding, enabling one to keep pace with the race of

rapid technolcgical advancements.

2.0 CLASSIFICATION OF INFORMATION USERS

2.1 Information Users:

Since 1977, WRI has come across variety of information users and they could be broadly divided as those, (1)

i) interested in no specific topic (Browsers);

ii) interested in retrieving relevant documents with specific topic of interest;

iii) interested in first hand information on recent developments through regular notification.

The division is based on the nature of the required information.

2.2 Browsing:

Browsers do not know what they are looking for. They are not for any specific document or information in the beginning and they merely seek something which interests them. The pleasure comes when spotting something as they wander through the pages.

Participants of the various courses that are conducted at WRI and the visitors to the Institute's library belong to Browsers' class; their interests being kindled out of sparks in the lectures, practicals and discussions.

Browsers usually go to library for skipping and skimming and this activates their further interest. Gradually one becomes a seeker of relevant documents on a specific topic of interest, thereby falling into second category of information seekers.

2.3 Information Retrieval:

Users who have periodic or occasional requirements for specific information of one kind or the other related to their topic of interest are grouped in this category. These information retrieval requirements arise from both in-house needs of WRI research personnel and the personnel engaged in welding at different levels in the various academic, research and industrial establishments throughout the country. In addition, the Browser-converts are also frequently joining this class.

As the horizon of one's interest expands over a specific field of knowledge, one tries to acquire as much first hand information in the field as possible to become a specialist.

2.4 Regular Notification:

Specialists constituting this class expect information on current developments to be posted to them regularly. Needs of such users could be fulfilled by suitable Current Awareness Services.

2.5 Interfacing:

Considering the requirements and the possible means of bridging the gaps in the field of information

handling, the treatments would be as discussed below.

Firstly, the Browsers' job is the least amenable to any treatment since Browsing involves human cognisance. WRI's fullfledged library caters fully to the needs of the Browsers.

Library users of the second kind would require the related and relevant information to be readily available to them and also expect library to provide aids to assist them in locating information. Here, the user along with the library staff is forced to handle large number of documents to locate what they want, but through manual methods. To satisfy this need, till 1977, no mechanised systems were available exclusively for welding information handling in India.

This ever steadily increasing need for the management of welding information was envisaged by WRI and computerised storage and retrieval system was established to cater the information retrievars. The features of this system are discussed separately.

Regular notification needs that arise due to the third category of users is met at WRI, by WRI-KEYWORDS Journal published periodically. Recent additions to WELD-IN-SEARCH system are conveyed through this journal to the users. Information on the current developments and the latest trends in welding is thus disseminated at regular intervals. WRI is also publishing bulletins periodically on the various completed research/consultancy projects carried out at the Institute. International Institute of Welding documents received and collected at the Institute are

also circulated to the welding personnel based on specific requirements.

3.0 THE WELD-IN-SEARCH SYSTEM (2)

Weld-in-Search system is exclusively used for finding out the literature of interest in welding and its related areas. The basic principle is the same as that used in manual searches. Instead of maintaining catalogues with title and author's name alone (in some cases with abstracts), here the catalogue includes other relevant information like source of publication and month of publication etc. The distinct feature of the system is that the information conveyed in a document, report or book, is coded in so called KEYWORDS or DESCRIPTORS. These keywords are so chosen, that they convey the gist of the information contained in that particular document.

3.1 Features of the System:

3.1.1 Contents of the System:

Documents in this system correspond to those cited in various journals, publications and research reports that are brought out in the field of welding and its allied areas. The records that represent documents contain the fields:

i) DOCUMENT REFERENCE NUMBER
ii) TITLE
iii) AUTHORS (Maximum of 4)
iv) SOURCE OF DOCUMENT (Abbreviated Name of The Journal, Volume No., Issue No., Month and Year of Publication, Page Nos.)
v) KEYWORDS (Maximum of 12)

The enquiries shall be done on all the fields as the case may be. Other special feature that is included will write messages, AUTHOR UNKNOWN and SOURCE UNKNOWN when author and source details respectively are not available. Further, provision also exists for addition, correction and deletion of records.

3.2 Hardware and Software Requirements:

3.2.1 Hardware:

The system is presently run on the ICL-2955 in-house computer at the BHEL Complex. Running WELD-IN-SEARCH requires the following minimal hardware configuration:

i) a 32 KW memory
ii) a Card reader
iii) Magnetic tape drives and magnetic tapes
iv) an EDS 200 Discpack
v) a line printer

In the present storage medium of magnetic tapes, around 30,000 documents could be accommodated, and with introduction of the magnetic discs, the storage capacity increases to nearly four lakhs documents.

3.2.2 Software:

The minimal software configuration is an operating system that supports the following:

i) COBOL compiler
ii) Data management softwares (for storage)
iii) File management utilities (for retrival)

3.2.3 Storage of Information:

The success of the WELD-IN-SEARCH system depends

mainly on the initial indexing of the information. Obviously this will require personnel having thorough background and knowledge of the various aspects of welding. Indexers should be able to decide the selection of most appropriate words that will convey the information effectively.

3.2.4 Selection of Keywords:

At the time of storage, Keywords are selected based on their relation to a broader or a narrower term with respect to the subject. As there may be more than one work to indicate the same information, a single word is standardised to cover all the related terms. A thesaurus has been prepared to cover such terms appearing in welding. This helps to document the information in a controlled language. Consider the following list of terms, which have a hierarchial relation within themselves.

TESTING (Group Term)
MECHANICAL TESTS (Broader Term)
FATIGUE TESTS (Lead-in-Term)
BEND TESTS
FATIGUE LOADING
} (Related Terms)

Let us consider the work FATIGUE TESTS in the list. It is clear that this is a 'lead-in-term (A lead-in-term is the one which is not used for indexing but lead to a term which could be indexed). There is a keyword MECHANICAL TESTS which is classified under Broader Term (BT). These two terms have a part-whole type relationship with each other. The terms BEND TESTS, FATIGUE LOADING etc, which are headed under Related Terms (RT) help in further defining

the idea conveyed by the term FATIGUE TESTS.

While choosing the keywords for an article the following points are kept in mind:

a) Welding process(es) discussed
b) Material or materials used
c) Sub-classification(s) of (a) and/or (b)
d) Shape or size applications
e) Special Techniques

Out of these categories, a maximum of twelve keywords are normally selected.

3.2.5 Storage with Computer:

Figure 1 gives the flow of information of documents through different stages before getting stored on a magnetic tape.

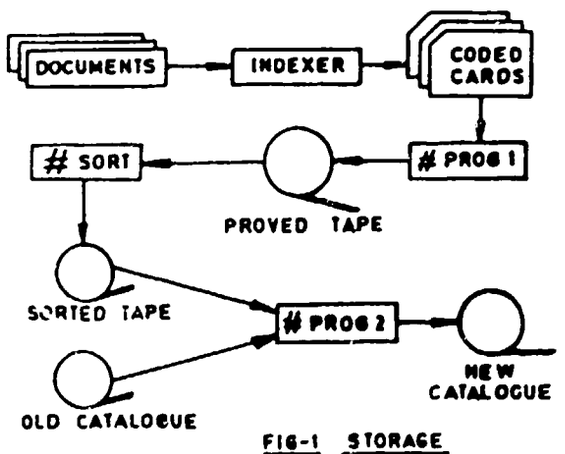


FIG-1 STORAGE

Subsequent to the selection of appropriate keywords or descriptors in consulation with the thesaurus the data is transferred to punched cards. Run of PROG 1 in computer checks and validates the data and thus run outputs PROVED TAPE of validated data which will be processed further. This validated records are sorted in the ascending order of their document reference number and outputed on to another tape, SORTED TAPE.

Finally, the PROG-2 combines the OLD CATALOGUE produced in the previous run, with the SORTED TAPE to produce the NEW CATALOGUE. During updating the NEW and OLD catalogues are used alternatively, as the NEW CATALOGUE in one run becomes the OLD CATALOGUE in the next run.

3.2.6 Retrieval:

At the time of retrieval, the information seeker may not give exact Keywords. He gives only some vague idea about the subject and possibly the process on which he wants the information. Indexer interacts with the user to get a clear idea of the specific interest of the users. It becomes the responsibility of the indexer to select out the 'appropriate keywords' which might have been used during the storage.

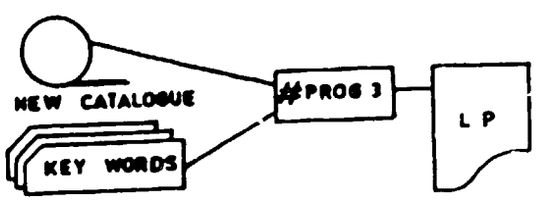


FIG-2 RETRIEVAL

The selected Keywords for retrieval are given as parameters to PROG-3 (Refer Fig.2). This program scans the NEW-CATALOGUE, finds and matches with the documents that contain the Keywords and prints the information with title, authors, source etc, on the line printer.

A typical computer output is shown in Annexure-1. The enquiry was made on NARROW GAP SAW. A scrutiny of the output shows that the listed documents contain the Keywords SAW and NGW. The same document would be extracted if an enquiry is made on any other keyword contained in the output. This sort of listing from the computer output will make a temporary index which will help in tracing the original information. The program also permits the use of Boolean operators AND, OR, NOT between Keywords with which the enquiry could be improved further.

The system is fully capable of storing and retrieving the information if used with due care. Size is no bar for the system, for the speed of computing or scanning is very high.

4.0 CONCULSION

Knowledge expands and multiplies by dissemination. To assimilate and disseminate the information gathered from various sources, WRI has been constantly taking efforts to organise the information which could lead to easy retrieval. WRI has classified the various information users and has implemented a computerised information storage and retrieval system called "WELD-IN-SEARCH" to satisfy the information retrieval

needs. WRI has also been periodically disseminating through its journal, KEYWORDS the recent trends and development in welding.

Thus, WRI in a modest way, caters to the welding information needs of India.

5.0 REFERENCES

1) HENLEY, J.P. Computer based library and information systems, 2nd edition, American Elsevier Inc., New York, 1972.

2) BHATIA, J.R., Weld-in-Search, a computerised welding information storage and retrieval system, Indian Welding Journal, Jan. 1977

3) KAREN SPARCK JONES, Automatic Keyword Classification for information retrieval, Butterworths, London, 1971

4) International Welding Theasurus, International Institute of Welding, U.K. 1980.

* * * * *

ANNEXURE 1

ARTICLES ON NARROW GAP SUBMERGED ARC WELDING

375C15 DEVELOPMENTS IN NARROW GAP WELDING•PC11

HENDERSON I J
AWJ VC22 N0003 05•Co 78
STEELS PICROALLOY MILD STEEL
SAW NGW FCAW TUBES AND PIPES
FIT UP PREHEATING WELD QUALITY PROCESS EQUIPMENT

34CCC8 SUBMERGED ARC NARROW GAP WELDING PROCESS WITH ONE RUN PER LAYERTECHNIQUE FOR HEAVY SECTIONS PC17
MORIGAKI O KUMAGAI R SUGA.KA I NISHIMURA J
IIW DOC XII A N0168 79
STEELS
WELDING SAW FLUXES SECTIONS
COMPOSITION NGW WELD QUALITY MECH PROPERTIES

34C3E2 EXPERIENCE IN THE NARROW GAP SUBMERSED ARC WELDING•PCC4

MALINCVSKA E EDUARD PIKNA
COMPILATION•VUZ•BRATISLAVA•1979
STEELS
WELDING SAW NGW PLATE
FLUXES NOZZLES NOTCH TOUGHNESS THERMAL PROPERTIES

34CE1C THE DEVELOPMENT OF A FLUX FOR NARROW GAP WELDING P004

KAZAR I ET AL
WP VC26 N0CC5 C5 75
DEVELOPMENT FLUXES CONSUMABLES
NGW STEELS LOW ALLOY BRITTLE FRACTURE
SAW TESTING SILICON COMPOSITION

354121 AUTOMATIC WELDING AND CLADDING IN HEAVY FABRICATION PCC3

ALTAMER A DE
MCEWJ VC12 N0CC5 05 8C
INCONEL NOZZLE TUBE TO TUBE PLATEFABRICATION
WELDING CLADDING AUTOMATION PRESSURE VESSELS
NGW SAW GMAW WELDING POSITION

354157 A NEW AC CONSTANT POTENTIAL POWER SOURCE FOR HEAVY PLATE DEEP GROOVE WELDING P006
GRIST F J ARMSTRONG F W
WJ VC59 NCCU6 Co 8C
STEELS POWER SOURCES AC VOLTAGE
WELDING SAW NGW ARC BLOW
TESTING FLUXES ADVANTAGES PENETRATION

354161 PRODUCTION ASPECTS OF PRESSURE VESSELS PCC2

WEST E G DR
MCEWJ VC12 NCCC7 C7 8C
REVIEWS PROCESS SELECTION THICKNESS PRESSURE VESSELS
WELDING CPAW NGW COSTS
ECONOMICS COM. SAW COMPARISONS