

APPENDIX 7A  
ANALYSIS OF RESULTS OF TEST ON ENGLISH  
ELECTRIC FACET CATALOGUE

The reasons for failure have been divided into four main sections as follows:-

1. Question
2. Indexing
3. Searching
4. System

Within each section there are a number of sub-divisions which in the main correspond to those used for the analysis of the test of the Aslib Cranfield Project, but it has not been necessary to use all these sub-divisions. However, some new sub-divisions have been added to cover reasons for failure applicable only to the English Electric tests. In many cases the reason for failure to find a particular document can be traced to two or three causes, and therefore the analysis will show the same failure coming up under different headings.

The first part of this appendix is a summary of the analyses grouped according to the main reasons for failure and it is followed by a few examples of the detailed analysis.

PART 1. SUMMARY OF REASONS FOR FAILURE

1. QUESTION

Too detailed.

34. This one search failed because the question was too detailed to enable a reasonable search to be made. The article dealt with friction and wear occurring in nickel-alloy solid lubricant systems which the indexer placed at Lcd (Solid lubricants). The question, however, required specific properties of graphite, and the searcher insisted upon "graphite" as an essential concept.

Misleading.

64. With a document entitled "Commutator:Logimag" which was written in French, with a brief abstract in English, the questioner required information on the application of magnetic logical elements to the automatic control of machinery. As the question was phrased, the searcher, after trying "automatic control" and "logical elements",

gave up the search, presuming the document would be indexed under the automatic control of a particular type of machine. In fact, it was indexed at Hq "Commutator" only.

183. With a question requiring information on contamination produced by fast bursts in gas circuits of graphite reactions, the searcher presumed that information on failure of gas circuits was required. As she concentrated on this aspect, the document was not traced. It actually concerned burst cartridges in fuel systems, and had been indexed as such.

189. With a question, "Is it possible adequately to grain refine high purity uranium?", one of the searchers was unable to trace the document, as he insisted on the concept "uranium". Actually the document was about uranium alloys, and had been indexed under Nud.

## 2. INDEXING

### Insufficient indexing

5. With a document on the Happurg Pumped Storage System, which gave details of the electrical equipment, the indexer made a single entry under

Bpmp 43 - (Germany) Pumped storage power systems.

The indexer should have realised that the document would be useful as a description of the particular types of electrical equipment used.

7. With a document on the low-energy neutron cross section of U235 and PU239, the indexer made an entry under Plutonium (239) but did not make an entry under Uranium (235), although each was of equal importance in the article.

9. With an article entitled "A double-delay line linear amplifier employing transistors", the indexer made one entry only, under Zmh 66: Amplifiers, Scintillation counters. Had he considered the concept "transistors", and made an entry under that, the document would have been traced.

20. A document entitled "Stress analysis in the presence of creep", was actually a review of literature. As such, it is obvious that any too specific placing would be unrealistic, but the three entries made by the indexer were not adequate. He treated the three concepts "Stress analysis", "Creep" and "Bibliographies", but did not combine

the first two.

As the question required information on the creep deformation of components under multiaxial stresses, the searcher insisted on more than a single concept. Thus the document remained untraced.

36. With an article entitled "Some elastic and thermal properties of zirconium and tungsten", the indexer ignored the concept of "elasticity", which should have been included in the indexing. As the searcher checked all material in the chain index under "Elasticity", which also included metals of any type, the document would have been traced if "elasticity" had been included.

54. With an article entitled "A double deck resistance strain gauge", which included information on the particular application for the measurement of bending strain on the outside surface of a structure, the indexer's entry under Zgb (Strain gauges) is insufficient. Had the indexer indexed the concepts "bending stresses", and "plates", the document would have been traced.

60. With an article entitled "Cross stresses in the laminar flow of liquids", the main body was concerned with cross-elasticity effects observed on an instrument consisting of circular metal plates, one stationary and one rotating. The single entry under Qe (Laminar flow) was inadequate.

Had the indexer included the concept of "elasticity", the document would have been found by one of the searchers.

From the last sentence of the summary, the concept of "fluid bearings" was implied. This also, was ignored by the indexer. Had an entry also been made under this concept, the document would have been found under the search programmes of the other searcher.

74. In an article on the internal friction of germanium and silicon, the indexer made an entry under "Internal friction: silicon", but did not make a similar entry for germanium, although they were of equal importance.

78. In an article on the thermal and electrical properties of Armco iron at high temperatures, there was, presumably, reference to the application of the electrical properties of iron in the generation of electricity. This was not indexed but was used by one of the searchers. This omission was not entirely the cause of the failure, as, by searching

in another two concepts, the document could have been traced.

81. In a document entitled "A practical standard transistorized optimum response controller", particular reference is made to the feedback circuits of non-linear control systems. The indexer made a single entry:

Xge lg Transistors: Feedback control systems

Had he made an entry under "Non-linear control systems", the document would have been traced by the third programme of the searcher who failed.

85. An article describing probes for the measurement of pressure, yaw angle, temperature, etc., of operating axial compressors and turbines was inadequately indexed. Even if the indexer was short of time, he should have made an entry at Dh Zfg (Flow measuring instruments: Gas turbines) rather than at Dh Zfr (Pitot tubes: Gas turbines). Such an entry would have enabled both searchers to trace the document.

108. A document on the cooling of an SR 5(V) air receiver was adequately indexed as far as the main body of the report went. However, an important appendix gave a method of calculation of the rate of cooling by convection, radiation and conduction of a vessel containing a gas, from which the question was obviously taken. Had entries been made under these concepts, the document would have been traced by both searchers.

118. In a report on induction induced swirl in a 'U' engine parallel valve combustion chamber, the design of a lip to produce the maximum swirl with the minimum pressure drop is described. The only entry made by the indexer was:

De Jf Qk Swirl: cylinders: diesel engines.

If the indexer had made an entry under "pressure drop", the document would have been traced at the first attempt by the Project staff, and at the third attempt of English Electric staff.

129. In an article on Deuce programme 500/3 for the optimum design of guide-vanes, the only entry made was under Dd Jeg (Guide vanes: Hydraulic turbines). The concept of "Deuce programming" was ignored. As the question required information on Deuce programmes for designing blades, etc. (almost an exact correlation of the title), both



searchers insisted upon the concept of "Deuce computer". With adequate indexing, the document would have been traced by both searchers.

134. With an article assessing the relative performance of various types of no-load voltage breakdown tests, one of the conditions of test is that of compressed air. Had this concept been included in the indexer's entry, the document would have been traced, as the concept was one of those given in the question.

158. In an article on the metallographic preparation of beryllium, titanium and refractory materials, palladium was mentioned as one of the refractory materials. Presumably the indexer did not have time to mention each metal discussed in the paper.

The only two entries made were:

1. Nbe Xul Etching: beryllium
2. Nti Xul Etching: titanium

The other metals mentioned in the report were entirely ignored. Had the indexer, instead of making these two entries, simply made a general entry under Xul (Etching) the subject of the document would have been more adequately covered. Also, the two searches would have been successful.

160. In a report on the relationship between weldability and transformation characteristics in the welding of medium carbon low alloy steels, the indexer did not index the concept "transformation". His only entry was:

Nse Pdk Weldability: medium carbon steel

As the question referred to the transformation characteristics of ferritic steels, neither concept was indexed, therefore the document remained untraced.

#### Incorrect indexing

25. In a paper describing the spectrographic analysis of beryllium in air, the indexer placed the document under the sample of beryllium in polyesters. Had a correct entry been made under "Spectrographic analysis" the document would have been traced.

80. In a document on the machining of titanium alloys the indexer made an entry under "Cutting: Machining: Titanium". A correct entry would have traced the document.

123. In an article describing induction motors used in rolling mills, the indexer made an entry under Be-ve Rolling with A.C. motors, instead of Beb-ve Rolling with induction motors.

Lack of entry, or incorrect entry in the chain index

8. In an article on designing silicon diodes and gates, the indexer made an entry under Gf If Semiconductor diodes: switching circuits, but the equivalent card under "Semiconductor diodes", was not included in the chain index.

16. With a document on the cathodic protection of zirconium, the indexer made the correct entry in the classified catalogue, but no card was filed in the chain index.

39. An inaccurate cross-reference, to "Diffusion: hydrogen", instead of "Hydrogen: diffusion" was the cause of a failure.

74. In an article on internal friction in semiconductors, the correct entry was made in the classified catalogue, but no cards were filed under "internal friction" in the chain index.

111. The indexer classified an article correctly under Ig Qsf Xf Measurement: Thermal conductivity: Transistors, but the card reading "Thermal conductivity: Transistors", was not in its correct place in the chain index.

177. With a document classified at Amp Wd Economics: Atomic power, the equivalent card was missing from the chain index, hence the failure.

Lack of cross references (\* denotes "see also" reference required)

3. A question on organic cooled deuterium moderated reactors failed because the searcher did not find his way to the entry in the chain index under "heavy water". Had there been a reference from deuterium to heavy water, the document would have been traced.

30. A question on the analysis of variance failed because the searcher did not check under this heading, but under "variance". A cross reference to "statistics", from "variance, analysis of" would have enabled the document to be traced. (There actually was already a cross reference from "analysis of variance" to "statistics").

51. In a question on the micro-analysis of weld metal constituents, the searcher failed to find the correct place in the chain index. A

reference from "micro-analysis" to "X-ray fluorescent spectroscopy" would have helped the searcher.

\*78. With a question on the thermal properties of iron, the searcher did not find his way to the correct entry under "Thermal conductivity". A see also reference from "thermal properties" to "thermal conductivity" should have enabled the document to be traced.

\*98. If there had been a see also reference from "wear" to "adhesive wear" (and the other subdivisions of wear) in the chain index, a document based on the wear of metals should have been traced by both searchers.

\*105. As 182 - a failure because there was no see also reference under "Bradwell" in the chain index, to Dkcq carbon dioxide graphite reaction.

149. With a question on the creep strength of ATR, one searcher failed to trace the document because there was no entry in the chain index reading ATR see Zirconium-copper-molybdenum alloys.

\*160. A question on the transformation characteristics of ferritic steels failed because the searcher was not able to find his way to the entry "medium carbon steels" in the chain index, under which the document was filed.

A see also reference from "ferritic steels" to "medium carbon steels" would have helped the searcher.

180. With a question on the determination of neutron flux fine structure, the searcher checked under "flux fine structure", but found no entry. There was an entry under "fine flux, structure" with a cross reference to "thermic utilisation", which she failed to find.

A cross reference from "flux fine structure" to "thermic utilisation", would have helped to trace the document.

\*182. With a question on the Calder Reactor, the searcher checked under Dk (Calder Hall) in the classified catalogue, (after checking in the chain index), and presumed that she had found all material on the reactor. However, there were other entries under carbon dioxide graphite reactors at Dkcq.

A see also reference to this section would have implied that not all material was at the Dk notation.

\*191. In a question on iodine filtration units, the searcher did not

find her way from "Iodine" to "Iodine isotopes". A see also reference would have helped.

Also, in the same question, a see also reference from "filtration units" to "radio-active waste plant" would have helped another approach.

#### Clerical error

7. Although the searcher found her way to a card reading Npu(239)Sbh Ie rf wg in the chain index, she failed to find the document because Ie should have read Ic.

53. Again both of the searchers found a card in the chain index reading Hg Hwd Ie Ij Rwl, which should have read Rcl. Without this inaccuracy the document would have been traced.

109. Both searchers traced a card in the chain index reading Hg Kce Maie Lj, which should have read Hq Kce Maie Lj. With the correct entry, the document would have been traced.

#### Inadequate guiding of the classified catalogue

2. With a question on underground steam power stations, the searcher found his way to Bpd Steam power stations, but was not led to the required subdivision, Bpdasn Underground steam power stations. If there had been adequate guiding to this point, the searcher should have been able to find the document.

### 3. SEARCHING

#### Lack of understanding, including those search programmes in which the words of the question only were used

54. In a question on a method of determining bending stresses on a flat plate with access to one side only, one of the searchers failed to realise that a possible instrument for measuring such stresses was a strain gauge. Had he checked under this concept, the document would have been traced.

83. With a question "Inaccuracies in electron diffraction work using the electron microscope", one of the searchers checked by material under Zdt Electron microscopes, rather than under electron microscopy, at Xulme, where the document was filed.

113. With a question on a computer method of calculating various moments of a flyweight for a turbine or diesel engine governor, the searcher checked under "computers", but did not think further to

to computer programmes. Had he done so, the document would have been traced.

134. With a question "If two open contacts are situated in compressed air, is the electrical breakdown dependent mainly on the peak value of an alternating voltage . . . . .", the searcher failed to check under interrupted air blast circuit breakers, through lack of subject knowledge.

183. With a question on fast bursts in gas circuits of carbon dioxide graphite reactors, the searcher from the Project Staff checked under failures in gas circuits and was unsuccessful. The searcher from English Electric realised that the question implied failure of cartridge cases in fuel elements.

Failure to use all the concepts in the question

3. With a question on organic cooled deuterium moderated reactors, both searchers ignored the concept "cooled". Had they checked under "organic coolants", the document would have been traced.

5. From a question on voltage regulators in pump storage schemes, one of the searchers checked only under the concept "voltage regulators", and ignored "pump storage". Had he checked under this concept, he would have been led to pump storage power stations at Bpmp, where the document was filed.

7. From a question on the neutron cross section of U235 and PU239, the searcher failed to check under either Uranium or Plutonium, the second programme of which would have traced the document.

78. From a rather detailed question, which included the aspect of direct generation of electricity by recycling iron, the searcher did not check under electrical properties of iron, under which the document was filed.

84. With a question on the estimation of sulphide inclusion content in steel, one of the searchers concentrated his search on sulphur and sulphide, and ignored the other two concepts (one implied) of non-metallic inclusions, and steel, from which he would have traced the document.

118. From a question on air swirl, pressure drop and flow rates in diesel engines, the searcher failed to use the concept "swirl",

which would have led him directly to the required document.

123. From a rather lengthy question on waveforms of rectifiers and alternators, and their effect on induction motors, the searcher did not use the concept "induction motors". (Actually, the document was inaccurately indexed also, but a search programme via "induction motors", would be necessary).

129. With a question on Deuce programmes for designing blades when subjected to pressure loading, the searchers ignored the concept of guide vanes (mentioned in the question.). This however would have involved a lengthy search.

159. With a question phrased thus "What happens when mixtures of  $\text{Fe}_2\text{O}_3$  and  $\text{Cr}_2\text{O}_3$  are heated together?", one of the searchers failed to check under either ferrous or chromium oxides, but searched under mixtures only.

189. With a question on the grain refining of high purity uranium, one of the searchers did not check under "grain refinement" which should have led him to the required document.

Failure to search systematically, i.e. to take each search programme to the limits allowed

5. In a question on voltage regulation when applied to pump storage schemes, one of the searchers found the section Bpmp in the classified catalogue, but failed to check all the cards in this section (approx. 50). If he had done so, he would have traced the document, at Bpmp 43.

42. With a question on the evaluation of the resistance of tools to interrupted cutting, the searcher managed to find his way to Vk Zuc Cutting tools, but checked the cards containing this notation only. He did not check the following cards, amongst which he would have found Vk Zuc Xh which was the one required.

63. With a question on the ignition of gaseous fuels, the searcher thought of the correct concepts, but did not take his search programme to the chain index. Had he done so, the document would have been traced.

66. A similar case - the searcher found his way to De Jf (Cylinders: diesel engines), but limited his search to the cards containing only this notation. A little further along, he would have traced the

required document at De Jf Kpj Pel.

69. In a question on the solution of partial differential equations using an analogue computer, one of the searchers failed twice in his search programmes to trace the document, although a thorough search in each case would have been successful. Firstly he thought of the correct concepts "Partial differential equations" and "analogue computers", but checked the classified section only, and did not take his search to the chain index. Also, in a later search programme, he tried "Partial differential equations" in the chain index, but on finding 13 places, neglected to check them all.

98. In a question on the relationship between friction and wear of metals without adhesion of the surfaces, one of the searchers checked only under "wear" in the chain index, from which he tried 7 places. Had he checked the general section "wear" in the classified catalogue (Pel), the document would have been traced, as the guiding should have led him to the section Pelb Adhesive wear.

109. In a question on adhesives used for fitting gaskets of different materials, one of the searchers checked in the classified catalogue under "Adhesives: felt" at Maie Lj. If he had checked the chain index at this point, he would have been led to the required document at Hq Kce Maie Lj.

157. In a question on the stresses in the plane of laminations in reinforced plastic materials, one of the searchers failed to follow up a see also reference to "Glass-reinforced plastics" which would have led to the required document.

Incorrect searching, i.e. checked the wrong or least likely place

2. With a question on underground steam power stations, one searcher traced the document immediately, whilst the other failed to check under the correct wording. Had he done so, the document would have been adequately traced.

Insufficient searching, i.e. did not try all possible places

17. With a question on high aluminium heat resistant steel alloys, the Project Staff found the document at the first attempt under "alloy steels", but the other searchers checked under "heat resistant steels", "aluminium steels", "high alloys steels", and "steel".

80. With a question on cutting of titanium alloys, one of the searchers failed to find the document because he limited his search to this concept whilst the other searcher broadened his search to "titanium", thinking that the required document could refer to both titanium and titanium alloys. The document was traced under Nti Vk Cutting: Machining: Titanium.

81. A question on the feedback circuits of a non-linear control system failed because one of the searchers did not try under "feedback control systems", which would have led to the document, although he thought of the concept "feedback circuits" for which he could find no entry in the chain index. As "feedback control systems" was the next card, the searcher should have noticed it.

Lack of knowledge of indexing practice or of terms used in indexing  
(applying to Project Staff only)

51. With a question on the micro-analysis of constituents in weld metal structures, the searcher insisted on the concepts "welds" (or similar concept) plus micro-analysis, absorptiometric analysis, etc. Actually it is the practice at English Electric to ignore metals and generally to make an entry under the method of analysis. Had this been known by the searcher, the search programmes would have been extended.

98. A similar situation, as the English Electric indexers make an entry under "Wear" at Pel+, instead of adding the metal or material upon which the wear takes place. Thus the searcher for the question on the relationship of friction and wear of metals did not trace the document.

105. With a question on the spring arm spider of the Bradwell fuel element, the searcher presumed that all material in the Bradwell reactor was placed at Dk (Bradwell). After looking here, she abandoned the search.

Apparently it is the English Electric practice to place only general descriptions of reactors at the Dk (Type), notation, whilst other more specific material is classified exactly, and placed under the type of reactor, e.g. Dkcq Carbon dioxide graphite reactors.

168. With a question on the dissipation of heat by natural convection through oil, the searcher did not realise that the term "natural



convection" was used in the schedules. She checked only "heat convection".

182. As question 105 - a failure due to the practice of placing general material on reactors only at Dk (Type). The searcher checked only Dk (Calder Hall), expecting all material to be there.

194. Again, a lack of knowledge of the term used by English Electric indexers, was the cause of this failure. The term "reactivity change", was one that the searcher did not expect to be used in the chain index.

Failures by searching via the chain index, which would be successes by permutation

8. A document classified at Gf If Semiconductor diodes: switching circuits, would have been traced if the notation had been permuted to If Gf. The searcher was able to check only under If Silicon diodes.

25. If the notation Mrm Nbe Xk Sampling: Beryllium: Polyesters had been permuted to Nbe Xk, the document required by a question on the spectrographic analysis of beryllium would have been traced.

39. A document on the diffusion of hydrogen in mild steel, classified at Ns d Oq Nh, remained untraced. The question "The behaviour of hydrogen in steel", had only one concept in common with the subject of the document. If the notation had been permuted to read Nh Ns d Oq, the document would have been traced.

63. A document classified at De Onb Ignition: diesel engines, remained untraced, because the concept "diesel engines" was not included in the question, but the concept "gas/air mixtures" was included. If the notation had been permuted, the document would have been traced under Onb by both searchers.

69. A document classified at Dk Qv Yge Zp Analogue computers: partial differential equation: heat transfer processes: nuclear reactors, remained untraced partly because of unsystematic searching of the chain index. It would have been traced by permutation under Yge Zp at the second attempt.

109. A document on adhesives used for gaskets would have been found by permutation by both searchers. It was classified at Hq Kce Maie Lj, whilst the searchers checked under Maie Lj. Permutation under this would have traced the document.

151. An article on heat transfer after a rapid change in wall section, would have been traced if permutation of the elements Kkhapk Qvc, and Kkhapm Qvc, had been used, to bring Qvc to the head.

#### 4. SYSTEM

##### Lack of sub-division, causing the placing to be too general

30. Ys "Statistics" appears to have too few subdivisions. This was pointed out by a question on the analysis of variance, for which there was no place. The document had been classified at Ys Statistics, and remained untraced because the searcher would not search at such a general heading.

##### Change in the schedules without adequate correction in the chain index or classified catalogue

124. With a question on glass braid insulation for industrial motor stator windings, the searcher found an entry in the chain index under "glass braid" which referred to two places containing the notation Mdj. She presumed from this that all material on glass braid would have been covered by her search.

However, on analysis, it appears that Mdj has been abolished, and included under Mdh "glass tape". Here the document was classified. If all material under "glass braid" had been transferred to "glass tape", with the appropriate cross reference the document would have been traced.

##### Ability to add, or omit concepts

63. This question, on the ignition of gas/air mixtures by a hot surface, shows up the difficulty of an indexer in being consistent. One of the searchers checked under "ignition - gaseous fuels", and amongst the entries from the chain index, he looked at De Lke Onb "Ignition: gaseous fuels: diesel engines".

This is the same subject as that covered by the document, but, because of the omission of Lke (gaseous fuels), the document remained untraced, and material on like subjects was separated. Permutations would enable such inconsistencies to be covered.

## PART 2. ANALYSIS OF INDIVIDUAL QUESTIONS

### Document No. 54

#### QUESTION

"Can you please find me a possible means of determining bending stresses on a flat plate when I have access to one side only ? "

Assessment: It appears that the document describes an instrument, whilst the question refers to the application of the instrument. Perhaps a difficult question, but with adequate indexing and searching, the document should be traced.

#### DOCUMENT

A double-check resistance strain gauge.  
(Product Engg. vol. 31, 10th Oct. 1960, pp 55-57).

Assessment: Describes the "Flexigage", a new type of strain transducer, especially designed to separate bending strain from the total strain at any point in shell or plate structures. The device consists of two foil strain gauges mounted on opposite sides of a plastic spacer. The device can be mounted directly on the outside surface of the structure thus eliminating back-to-back arrangement.

SEARCH BY PROJECT STAFF Success

SEARCH BY E.E. STAFF Failure

#### ASSESSMENT OF INDEXING

Zgb. Strain gauges. One entry only.

If the indexer had also made an entry under plates and shells, the subject of the paper would have been indexed more adequately. However, with the English Electric search programme, the document would still not have been found unless the concept "bending stresses" had been included as well.

#### ASSESSMENT OF SEARCHING

##### English Electric Staff

The search programme consisted of

- (1) Bending stresses: plates Kwe Ppg
- (2) Bending: Plates Kwe Pjf (no entries)

As the Project searcher found the document at the second search, one can only assess the English Electric search as inadequate.

SUGGESTED RE-INDEXING

Kwe Ppg Zgb. Strain gauges: bending stresses: plates.

COMMENTS

The cause of the failure can be divided into two. Firstly, the indexer could have made a more detailed entry, as the article was specifically in the use of strain gauges to measure bending strain. Secondly, the searcher should have thought of the possible instruments to assess bending strains, and checked under those.

REASONS FOR FAILURE

- (1) Searching (inadequate)
- (2) Indexing (inadequate)

Document No. 60

QUESTION

"Please supply information on cross-elasticity effects in a homogeneous liquid with respect to its possible application to fluid bearings".

Assessment: A clear question, which should enable the document to be traced without trouble.

DOCUMENT

Cross stresses in the laminar flow of liquids.  
(Phys. Fluids. vol. 3, May/June, 1960, pp 427-437).

Assessment: Cross-elasticity effects in a simple homogeneous liquid manifest themselves in cross stresses observed in an instrument consisting of circular metal plates, one stationary, the other rotating opposite it. Stator can be displaced along axis of rotation against forces exerted by springs. Stator and motor at rest are in contact. On rotation, cross stresses in liquid separate stator from rotor, and a bearing effect is produced.

SEARCH BY PROJECT STAFF                      Failure

SEARCH BY E.E. STAFF                      Failure

ASSESSMENT OF INDEXING

One entry only Qe Laminar flow.

Quite inadequate indexing. The purpose and application of the theory appears to have been missed.

ASSESSMENT OF SEARCHING

Project Staff

The searcher found trouble in gaining entry to the chain index. Of his four search programmes, he only found one entry in the catalogue.

1. Fluid bearings (no entry)
2. Bearings Lc Jt (no card in classified catalogue)
3. Homogeneous liquids (no entry)
4. Liquids, homogeneous (no entry)

The concept of "cross-elasticity" he ignored.

English Electric Staff

The searcher tried:

1. Cross-elasticity (no entry)
2. Elasticity Pby (classified catalogue)
3. Homogeneous liquids
4. Liquids, homogeneous

SUGGESTED RE-INDEXING

1. Qe Qre Elasticity: Laminar flow
2. Jtahd Fluid bearings

COMMENTS

An indexing failure entirely. Had the indexer made adequate entries, the document should have been traced, at the first attempt with the Project staff, and the second attempt with English Electric staff.

REASONS FOR FAILURE

Indexing inadequate.

Document No. 63

QUESTION

"The temperature required for the ignition of gas/air mixtures by a hot surface is different for different surface materials. Can you find any reports dealing with the mechanism of why this is so ?"

Assessment: Unless the document can be traced under the concept of ignition of gaseous mixtures, this question will be difficult to trace, as the next concept "surface" can be interpreted in many ways.

DOCUMENT

Occurrence of surface ignition depends on surface temperature, local air-fuel ratio.  
(S.A.E.Jnl. vol.68, Oct.1960, pp 58-61).

Assessment Investigates surface ignition, the mechanism of ignition by hot surfaces in the combustion chamber, which causes pre-ignition, wild ping and rumble. Surface ignition occurs when the mixture is heated about its ignition temperature and the mixture composition is within the limits of inflammability. The surface ignition process is independent of the type of surface.

SEARCH BY PROJECT STAFF Failure

SEARCH BY E.E. STAFF Failure

ASSESSMENT OF INDEXING

Dc Onb Ignition: diesel engines.

Not adequate indexing. Lke (gaseous fuel) should have been included, as the indexer should have realised the concepts of ignition of gaseous materials is important elsewhere than in diesel engines, and so may be searched for without this last concept. However, this does not help in tracing this particular failure.

ASSESSMENT OF SEARCHING

Project Staff

Adequate. The document should have been indexed to include Lke Onb.  
Ignition of gaseous fuels.

English Electric Staff

Apparently the searcher, although he tried the same search programme of ignition of gaseous fuels, did not refer to the chain index, but only to the classified catalogue.

SUGGESTED RE-INDEXING

De Lke Onb. Ignition: gaseous fuels: diesel engines.

COMMENTS

This question shows up the difficulty of an indexer in being consistent.

The Project searcher checked under "Ignition: gaseous fuels", and amongst the entries from the chain index, he looked at De Lke Onb. Ignition: gaseous fuels: diesel engines.

This is the same subject as that covered in the document, but, because of the omission of Lke (Gaseous fuels) the document remained untraced, and the material on like subjects was separated.

An apparently insurmountable difficulty unless permutation is used.

With permutation, the document would have been traced. (E.E. and Project staff).

REASONS FOR FAILURE

(1) System (ability to add or omit concepts).



Document No. 85

QUESTION

"Can we find a description of an instrument to measure total pressure, total temperature and flow direction simultaneously in between the blade rows of compressors or turbines?"

Assessment: A question fairly based on the subject of the article - it should present no difficulty in searching.

DOCUMENT

"Educated" probes get flow data.  
(Gas Turbine, vol.1, Nov-Dec.1960, pp 22-23).

Assessment: New development tools and techniques for obtaining gas flow data remotely and automatically, on operating axial compressors and turbines. A two page article.

SEARCH BY PROJECT STAFF

Failure

SEARCH BY E.E. STAFF

Failure

ASSESSMENT OF INDEXING

Dh Zfr Pitot tubes: Gas turbines.

Inadequate indexing. The indexer has not covered the description given of the instruments for measuring pressure, yaw angle, temperatures, etc.  
If time was short, an entry should have been made at Zfg (+Dh as the application is specifically for measuring the flow between blades of turbines).

ASSESSMENT OF SEARCHING

Project Staff

The search programmes were thus:-

1. Pressure measuring instrument Zgh + (chain index)
2. Flow measuring instrument Zfg

The searcher should have taken the second search programme to the chain index, as the question specifically stated that the application was for measurement in turbines and compressors.

English Electric Staff

The search programmes were:-

1. Flow measuring instruments: blades: compressors (no card)
2. Flow measuring instruments: blades: turbines (1 card)
3. Pressure measurement: blades (5 cards)
4. Temperature measuring instruments and blades (6 cards)

Presumably the searcher did not check the chain index in any of the search

programmes.

A sensible extension of each programme would have been to have dropped the concept "blades". However, the document still would not have been traced with the present indexing.

#### SUGGESTED RE-INDEXING

Dh Zfg Flow measuring instruments: turbines.

#### COMMENTS

This search points out the confusion arising in the minds of the indexer and searcher, about the use of various types of flow, pressure and temperature measuring instruments. Further directions in the schedules, and "see also" references in the chain index may help to sort this out.

The failure is due principally to lack of indexing. The indexer should have either made an entry generally at Dh Zfg (flow measuring instruments: turbines) or more specifically under "pressure measurement", etc.

Also, the searchers in each case did not follow their search programmes to their allowable conclusion. However, this would not have traced the document with the present indexing.

#### REASONS FOR FAILURE

- (1) Indexing insufficient.

Document No. 152

QUESTION "What is the % free activity for various channels loaded in the Calder Reactors 1, 3 and 4, measured during commissioning".

Assessment: A clear question, which should have traced the document without difficulty.

DOCUMENT A re-assessment of the reactor parameters measured during the commissioning of the Calder reactors. (U.K.A.E.A. P.G.Memo 317(CR)).

Assessment: A report summarising the measurements of the reactor parameters taken during the commissioning of the Calder Reactors, together with an estimate of their errors. In the case of the pressure coefficients and super-critical control rod calibrations, results from the first Chapelcross Reactor are also included.

SEARCH BY PROJECT STAFF Failure

SEARCH BY E.E. STAFF Success

ASSESSMENT OF INDEXING

(1) Dkcq S Xcc

(2) Dkcq Xcc

According to the English Electric indexing rules, this appears to be adequate. However, an entry in the chain index under "Calder reactors" stating "for general description only, otherwise check under carbon dioxide graphite reactors", would have helped the searchers.

ASSESSMENT OF SEARCHING

Project Staff

1. Calder reactors. Dk (Calder Hall) in classified catalogue

The searcher made this his only search programme, because he presumed that all material on the Calder Hall reactors would be included at Dk.

It appears that English Electric practice was to include only general material here. All other reports were indexed under Dkcq.

COMMENTS

A searching failure caused by two reasons:

1. A lack of cross-reference in the chain index under "Calder reactors" to the section "Carbon dioxide graphite reactors".

2. In a smaller way, lack of the searcher's knowledge of English Electric indexing rules.

REASONS FOR FAILURE

- (1) Lack of cross reference
- (2) Searcher's lack of knowledge of indexing practice

English Electric Search

Found at first attempt.

COMMENTS

Subject knowledge would appear to be useful here, to know to check under "commissioning" in the chain index, but possibly may be due to knowledge of indexing practice.

Document No. 158

QUESTION "What methods are available for metallographically preparing and etching Palladium (Pd) ?"

Assessment: A fair question, which should have traced the document.

DOCUMENT Procedures for the metallographic preparation of beryllium, titanium and refractory materials.  
(B.M.I. Defence Metals Inf. Centre B6603).

Assessment: No abstract, but the paper presumably covers the metallographic preparation of several metals.

SEARCH BY PROJECT STAFF Failure

SEARCH BY E.E. STAFF Failure

ASSESSMENT OF INDEXING

(1) Nbe Xul Etching: Beryllium

(2) Nti Xul Etching: Titanium

Inadequate indexing. The indexer ignored the other metals contained in the report, and did not even cover them with an entry "refractory materials". He did not even make a general entry under Xul "Etching".

ASSESSMENT OF SEARCHING

Project Staff

1. Palladium - 3 places
2. Etching - 2 places (obviously ignoring any other metals specifically mentioned).

From the question the searching appears to be adequate. The searcher should have traced the document by these programmes had the indexing been sufficient.

English Electric Staff

1. Palladium Npd
2. Etching Xul+

Apparently the searcher did not go to the chain index - bad searching technique, but the document would still not have been traced with better technique.

SUGGESTED RE-INDEXING

Npd Xul Etching: Palladium

Xul Etching

COMMENTS

A complete indexing failure. The indexer covered only two of the metals referred to in the article, and then, presumably, only because they appeared in the title - not because they were of more importance. Even considering that the indexer made a general entry under Xul "Etching", which would have covered, somewhat, the remainder of the refractory metals discussed in the paper.

With this general entry, the document would have been traced by both searchers.

REASONS FOR FAILURE

Indexing inadequate.