What is the ILO?

The ILO is the international organization responsible for drawing up and overseeing international labour standards. It is the only 'tripartite' United Nations agency that brings together representatives of governments, employers and workers to jointly shape policies and programmes promoting Decent Work for all. This unique arrangement gives the ILO an edge in incorporating 'real world' knowledge about employment and work... The main aims of the ILO are to promote rights at work, encourage decent employment opportunities, enhance social protection and strengthen dialogue on work-related issues.
What is ISCO?

The International Standard Classification of Occupations (ISCO) is one of the main international classifications for which ILO is responsible. It belongs to the international family of economic and social classifications.

ISCO is a tool for organizing jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. Its main aims are to provide: a basis for the international reporting, comparison and exchange of statistical and administrative data about occupations; a model for the development of national and regional classifications of occupations; and a system that can be used directly in countries that have not developed their own national classifications.

It is intended for use in statistical applications and in a variety of client oriented applications. Client oriented applications include the matching of job seekers with job vacancies, the management of short or long term migration of workers between countries and the development of vocational training programmes and guidance.

The first version of ISCO was adopted in 1957 by the Ninth International Conference of Labour Statisticians (ICLS). It is known as ISCO-58. This version was superseded by ISCO-68, which was adopted by the Eleventh ICLS in 1966. The third version, ISCO-88, was adopted by the Fourteenth ICLS in 1987. Many current national occupational classifications are based on one of these three ISCO versions.

ISCO has recently been updated to take into account developments in the world of work since 1988 and to make improvements in light of experience gained in using ISCO-88. The updating did not change the basic principles and top structure of ISCO-88 but significant structural changes were made in some areas. The updated classification was adopted in December 2007 and is known as ISCO-08. Many countries are now updating their national classification either based on ISCO-08 or to improve alignment with the new international statistical standard.

The resolution adopting ISCO-08, the classification structure and correspondence tables with ISCO-88 are available on the ISCO Website in English, French and Spanish. Final definitions of the ISCO-08 groups are currently available on this Website in English only.

The structure, definitions, correspondence tables, and an Introduction summarising the updating process, outlining the methodology and conceptual model used and describing the main differences between ISCO-88 and ISCO-08 will be released in book form as ISCO-08 Volume 1. An index of occupation titles in both alphabetical and numerical order will also be made available on the Website and subsequently in book form as ISCO-08 Volume 2.

French and Spanish versions of each component will be made available as soon as possible after the English versions have been finalized.

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Distinctions between different occupational classes were introduced in population censuses undertaken in the early parts of the 19th century in several countries, but the identification of occupation and industry as different variables, each requiring its own classification, was only made towards the end of that century, as it became increasingly clear that the division of labour between firms and organizations in an industrial society was distinct from the division of labour between different jobs within the same firm.

The history of the development of the International Standard Classification of Occupations (ISCO) has always been closely connected with the work of the International Conference of Labour Statisticians (ICLS) which meets under the auspices of the International Labour Organization. The need for an international standard classification of occupations was, in fact, discussed at the first ICLS in 1923, although this conference did not propose a specific grouping of occupations.

The first concrete step towards its establishment was the adoption, by the Seventh ICLS in 1949 of nine major groups termed the International Standard Classification of Occupations. The seventh ICLS proposed further development of this classification to more detailed level and identified basic principles to be followed in the collection and tabulation of occupational data, including that: the basis of any classification of occupations should be the trade, profession or type of work performed by an individual, irrespective of the branch of economic activity to which he or she is attached or of his or her status in employment; proprietors or owners who mainly perform the same work as that performed by employees in their own or in a similar enterprise should be allocated to the same group to which the employees are allocated.

In 1952, the ILO published the International Classification of Occupations for Migration and Employment Placement (ICOMEM), with descriptions of 1,727 occupations based on national reference materials sourced principally from 13 countries, and organized within the framework of the nine major groups adopted by the Seventh ICLS. In 1954 the Eighth ICLS approved a list of minor groups which was subsequently submitted to the governments and to a group of experts for comments.

In 1957, the Ninth ICLS adopted the first complete version of the International Standard Classification of Occupations (ISCO-58) comprising a classification structure of 10 major groups, 73 minor groups, 201 unit groups, 1,345 occupations and an index of occupational titles. All groups at each level of the classification were given a unique code, title and description, drafted in consultation with the governments. It was published in 1958.

The Ninth ICLS also proposed a prompt revision of ISCO-58. In 1965, a working party examined proposals made on the basis of comments from about 80 countries and ten international organisations concerning the classification. This facilitated the development of a draft classification which was discussed, amended and adopted as ISCO-68 by the Eleventh ICLS in 1966. ISCO-68 consists of 8 major groups, 83 minor groups, 284 unit groups and 1,506 occupational categories. It includes definitions for each of the 1,881 groups describing the general functions of the occupations as well as the main tasks performed by the workers concerned. It includes an expanded alphabetical list of several thousand titles as well as a table of conversion from ISCO-58 to ISCO-68. The English and French versions were published in 1969 and the Spanish version in 1970.

The third edition of ISCO (ISCO-88) was adopted by the 14th ICLS in 1987 and approved by the ILO Governing Body in 1988. The major changes introduced were that the underlying principles and concepts were made more explicit than in the previous versions; skill level and skill specialization were identified as the main similarity criteria for arranging occupations into groups; and the 10 major groups, 28 Sub-major groups, 116 minor groups and 390 unit groups in ISCO-88 provide much less detail than its predecessors.
because experience had shown that it was very difficult to develop a comprehensive set of detailed categories that are applicable to all countries.

Early during the first decade of the 21st century, it became clear that there was a need to update ISCO-88. In December 2003 the 17th ICLS requested that the ILO complete work to update ISCO-88 by the end of 2007 so that the results could be taken into account in national preparations for the majority of population censuses to be undertaken in the 2010 round. The updated classification, ISCO-08 was adopted by a Meeting of Experts in Labour Statistics in December 2007.

Whilst it employs a similar conceptual model to that used for ISCO-88, and the 10 major groups were not changed in concept, ISCO-08 is slightly more detailed at its disaggregate levels and comprises 43 Sub-major groups, 131 minor groups and 425 unit groups. Like its predecessor, ISCO-08 provides descriptions for all of the categories identified at each of the four levels of its structure, and can be extended by defining detailed occupations if and when required for specific national or regional purposes.

### What is an occupational classification?

An occupational classification is a tool for organising all jobs in an establishment, an industry or a country into a clearly defined set of groups according to the tasks and duties undertaken in the job. It normally consists of two components:

- the classification system itself, which gives the guidelines on how jobs are to be classified into the most detailed groups of the classification and how these detailed groups are to be further aggregated into broader groups. It includes the occupational titles and codes, and represents a value set for the variable >occupation=, a variable which describes the different tasks and duties of jobs.

- a descriptive component, which usually consists of descriptions of the tasks and duties as well as other aspects of the jobs which belong to each of the defined groups, including goods and services produced, skill level and specialization, occupations included and excluded, entry restrictions, etc. These descriptions can be said to constitute a dictionary of occupations.

An occupational classification can be compared to a system of maps for a country, where the top level of aggregation corresponds to a small scale road map for the main motorways and highways; the next level corresponds to a set of larger scale maps for, say, each of the main regions, also showing provincial and local roads; and so on. At the most detailed level are the detailed technical maps used by municipal engineers to plan sidewalks, traffic lights, road extensions, etc. Such detailed technical maps can be compared to the job descriptions which are used by enterprises for personnel management and wage systems which in most countries are not the concern of national authorities, except for the management of public sector employees.

Any classification of occupations is based on principles for (a) classification unit(s), (b) classification variable(s) and (c) similarity criteria.

### Classification unit(s)

Occupational classifications generally classify jobs. Jobs can be:

- past, present or future jobs;

- paid employment jobs;
self-employment jobs;

jobs without incumbents (vacancies);

shared by more than one person (job sharing)

Paid employment jobs are those jobs where the incumbents hold explicit (written or oral) or implicit employment contracts which give them a basic remuneration which is not directly dependent upon the revenue of the unit for which they work (this unit can be a corporation, a non-profit institution, a government unit or a household). Some or all of the tools, capital equipment, information systems and/or premises used by the incumbents may be owned by others, and the incumbents may work under direct supervision of, or according to strict guidelines set by the owner(s) or persons in the owners' employment. (Persons in "paid employment jobs" are typically remunerated by wages and salaries, but may be paid by commission from sales, by piece-rates, bonuses or in-kind payments such as food, housing or training.)

Self-employment jobs are those jobs where the remuneration is directly dependent upon the profits (or the potential for profits) derived from the goods and services produced (where own consumption is considered to be part of profits). The incumbents make the operational decisions affecting the enterprise, or delegate such decisions while retaining responsibility for the welfare of the enterprise. (In this context "enterprise" includes one-person operations.)

Jobs which have the same set of main tasks and duties are aggregated (grouped together) into occupations. Occupations are grouped together into narrowly or broadly defined occupational groups on the basis of similarity in the type of work done, i.e. similarity in the tasks and duties performed. The units described in a dictionary of occupations are occupations and occupational groups. (At the enterprise level, the wage and salary scheme may describe individual jobs.)

When jobs are the primary objects classified by an occupational classification, a person can be classified according to an occupation or occupational group only through his or her relationship with a job. This can be a job held in the past, a current job or a job he or she is looking for. In this context "to have a job" is meant in a broad sense, so that the classification should be applicable to all employment situations: employees, the self-employed and contributing family members, i.e. everyone working for pay, profit or family gain. It follows from this that, depending on the circumstances, one person may be classified according to several different occupations if he or she has (has had or is expected to have) more than one job. Users who need to work with only one occupation for each person need to formulate priority rules for selecting one job to be classified. Such rules are normally formulated with reference to the most hours worked or income earned during a reference period.

The classification variable(s)
The classification variable in an occupational classification is usually the type of work done, or the tasks and duties performed.

The similarity criteria
The similarity criteria are fundamental to a classification of occupations. They determine the conceptual framework for the composition and location of categories and provide guidance on how to classify new or omitted occupations, how to establish similarity in the main attribute, and how to organize the occupations in the classification. They must relate to known attributes of an occupation and must be clearly and consistently defined and measured according to agreed methodology. Ideally, they should be determined by the use that will be and given to the classification. Thus, to be useful for job placement, human resource budgeting, education planning, skill should be the best criterion; but if the classification is to be useful for the analysis of social stratification or mobility, then occupational prestige would be a more suitable criterion.
Similarity criteria should meet the needs of any user. Unfortunately different users have different requirements with respect not only to the appropriate level of aggregation but also to the most appropriate similarity criteria. For some users (for example, insurance companies) important criteria may be whether the work is carried out outdoors or indoors, or whether travelling is required or not. For other users, the social status of the work may be most important, or they may want to focus on the materials worked with, the goods and services produced or whether the work requires direct contact with clients and customers. By deciding on the main similarity criteria to be used in the occupational classification, its developers implicitly or explicitly give priority to some users' needs over others. The implications of this for the overall use of the classification must therefore be carefully evaluated.

National occupational classifications and dictionaries are usually designed to serve several purposes. Although the detailed occupational descriptions and the classification structure must be seen as two parts of an integrated whole, different user areas have different degrees of interest in the various elements: Detailed occupational descriptions are used by those who need to know about the tasks, duties and working conditions of jobs. They are mostly client oriented users (for example those responsible for job placement, vocational training and guidance, migration control, etc.). The occupational descriptions should be designed primarily to meet the needs of such users, but must also include the descriptive elements necessary for applying relevant aggregation schemes.

The classification structure, i.e. the grouping of the detailed occupations together in progressively more aggregate groups, should be designed mainly to facilitate the sorting of jobs and persons into groups, i.e. for the matching of job seekers and vacancies, or for statistical description and analysis of the labour market and the social and economic structure of society.

Depending on the purpose of the study, the variable occupation may be regarded as the main variable in the empirical analysis, or it may serve as a background variable. Used as a background variable, it may serve as a proxy for other variables such as socio economic groups or working conditions, or it may be used as one element in the construction of other variables, such as social class or socio economic status. The resolution needed for the value set to satisfy these different areas of use, i.e. the degree of detail in the classification, will differ greatly, for example, from the distinction between just two groups (manual v. non-manual or white-collar v. blue-collar) to the more than 10,000 occupations described in the U.S. Dictionary of Occupational Titles.

The current version of the International Standard Classification of Occupations, ISCO-88, was adopted by the 14th ICLS in 1987 and approved by the ILO Governing Body in 1988, in English, French and Spanish.

ISCO-88 provides a system for classifying and aggregating occupational information obtained by means of population censuses and other statistical surveys, as well as from administrative records.

ISCO 88 groups jobs together in occupations and more aggregate groups mainly on the basis of the similarity of skills required to fulfil the tasks and duties of the jobs. Two dimensions of the skill concept are used in the definition of ISCO 88 groups:

- **Skill level**, which is a function of the range and complexity of the tasks involved, where the complexity of tasks has priority over the range; and

- **Skill-specialisation**, which reflects type of knowledge applied, tools and equipment used, materials worked on, or with, and the nature of the goods and services produced. It should be emphasised that the focus in ISCO 88 is on the skills required to carry out the tasks and duties of an occupation and not on whether a
worker in a particular occupation is more or less skilled than another worker in the same or other occupations.

**MAIN OBJECTIVES**

ISCO-88 has three main aims. The first is to facilitate international communication about occupations by supplying national statisticians with a tool to make national occupational data available internationally.

The second is to make it possible for international occupational data to be produced in a form which can be useful for research as well as for specific decision-making and action-oriented activities, such as those connected with international migration or job placement.

The third aim is to serve as a model for countries developing or revising their national occupational classifications. It should be emphasised that, while serving as a model, ISCO-88 is not intended to replace any existing national classification of occupations, as the occupational classifications of individual countries should fully reflect the structure of the national labour market. (The ILO Bureau of Statistics is at present preparing a manual on how to develop and use national occupational classifications.) However, countries whose occupational classifications are already aligned to ISCO-88 in concept and structure will find it easier to develop necessary procedures for making their occupational statistics internationally comparable.

It should be noted that, in many cases, countries will wish to develop in their national classifications finer structural and definition details than those contained in ISCO-88. In certain cases they may wish to include coded information on Job Content Factors and detailed occupational descriptions, which are of particular interest for wage settlements, vocational guidance and training, placement services, or analysis of occupation-specific morbidity and mortality.

**CONCEPTUAL FRAMEWORK**

The framework necessary for designing and constructing ISCO-88 has been based on two main concepts: the concept of the kind of work performed or job, and the concept of skill.

Job - defined as a set of tasks and duties executed, or meant to be executed, by one person - is the statistical unit classified by ISCO-88. A set of jobs whose main tasks and duties are characterised by a high degree of similarity constitutes an occupation. Persons are classified by occupation through their relationship to a past, present or future job.

Skill - defined as the ability to carry out the tasks and duties of a given job - has, for the purposes of ISCO-88 the two following dimensions:

(a) Skill level - which is a function of the complexity and range of the tasks and duties involved; and

(b) Skill specialisation - defined by the field of knowledge required, the tools and machinery used, the materials worked on or with, as well as the kinds of goods and services produced.

On the basis of the skill concept thus defined, ISCO-88 occupational groups were delineated and further aggregated.

Bearing in mind the international character of the classification, only four broad skill levels were defined. They were given operational definitions in terms of the educational categories and levels which appear in the
The use of ISCED categories to define the four skill levels does not imply that the skills necessary to perform the tasks and duties of a given job can be acquired only through formal education. The skills may be, and often are, acquired through informal training and experience. In addition, it should be emphasised that the focus in ISCO-88 is on the skills required to carry out the tasks and duties of an occupation - and not on whether a worker having a particular occupation is more or less skilled than another worker in the same occupation. Therefore, as a rule, the following operational definitions of the four ISCO-88 skill levels apply where the necessary occupational skills are acquired through formal education or vocational training.

(a) The first ISCO skill level was defined with reference to ISCED category 1, comprising primary education which generally begins at the age of 5, 6 or 7 and lasts about five years.

(b) The second ISCO skill level was defined with reference to ISCED categories 2 and 3, comprising first and second stages of secondary education. The first stage begins at the age of 11 or 12 and lasts about three years, while the second stage begins at the age of 14 or 15 and also lasts about three years. A period of on-the-job training and experience may be necessary, sometimes formalised in apprenticeships. This period may supplement the formal training or replace it partly or, in some cases, wholly.

(c) The third ISCO skill level was defined with reference to ISCED category 5, (category 4 in ISCED has been deliberately left without content) comprising education which begins at the age of 17 or 18, lasts about four years, and leads to an award not equivalent to a first university degree.

(d) The fourth ISCO skill level was defined with reference to ISCED categories 6 and 7, comprising education which also begins at the age of 17 or 18, lasts about three, four or more years, and leads to a university or postgraduate university degree, or the equivalent.

Unavoidably, some subjective judgement was involved in determining the skill levels of occupations, or occupational groups, in the structure of ISCO-88. Many national classifications and national circumstances have been examined to gather data for this purpose, and it is hoped that the decisions made reflect prevailing situations and main trends.

The conceptual approach adopted for ISCO-88 resulted in a pyramid whose hierarchical structure consists of ten major groups at the top level of aggregation, subdivided into 28 sub-major groups, 116 minor groups, and 390 unit groups.
As can be seen from the above table, out of the ten major groups, eight have been linked to the four ISCO skill levels - which, as mentioned earlier, were given operational definitions by reference to the educational categories and levels of the International Standard Classification of Education. The concept of skill level was not applied in the case of Major group 1, Legislators, senior officials and managers, and Major group 0, Armed forces. The reason for this was that, based on information from national sources, skills for executing tasks and duties of occupations belonging to each of these two major groups vary to such an extent that it would be impossible to link them with any of the four broad ISCO-88 skill levels.

Further sub-divisions of ISCO-88 occupational groups, providing successively finer detail, were carried out on the basis of skill specialisation, defined by reference to the field of knowledge required, the tools and machinery used, the materials worked on or with, as well as the kinds of goods and services produced.

The 28 sub-major groups, at the second ISCO-88 level of aggregation, represent an innovation in the sense that all of the preceding international occupational classifications have had a substantial numerical gap in the number of groups at their first and second levels of aggregation. For instance, in the case of ISCO-68 there were eight groups at the first level of aggregation followed by 83 groups at the second level. This presented an imbalance in the number of groups needed, on the one hand, for the presentation of the occupational structure in broad terms and for cross-classifying with variables such as industry or detailed age groups and, on the other hand, for presenting the occupational structure without cross-classifying, or when cross-classifying with variables such as sex or broad age groups.

The 390 unit groups, representing the most detailed level of the ISCO-88 structure, in most cases consist of

<table>
<thead>
<tr>
<th>Major groups</th>
<th>Sub-major groups</th>
<th>Sub-groups</th>
<th>Unit groups</th>
<th>ISCO Skill level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Legislators, senior officials and managers</td>
<td>8</td>
<td>33</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2 Professionals</td>
<td>4</td>
<td>18</td>
<td>55</td>
<td>4th</td>
</tr>
<tr>
<td>3 Technicians and associate professionals</td>
<td>4</td>
<td>54</td>
<td>73</td>
<td>3rd</td>
</tr>
<tr>
<td>4 Clerks</td>
<td>2</td>
<td>7</td>
<td>23</td>
<td>2nd</td>
</tr>
<tr>
<td>5 Service workers and shop and market sales workers</td>
<td>2</td>
<td>9</td>
<td>23</td>
<td>2nd</td>
</tr>
<tr>
<td>6 Skilled agricultural and fishery workers</td>
<td>2</td>
<td>6</td>
<td>17</td>
<td>2nd</td>
</tr>
<tr>
<td>7 Craft and related trades workers</td>
<td>4</td>
<td>16</td>
<td>70</td>
<td>2nd</td>
</tr>
<tr>
<td>8 Plant and machine operators and assemblers</td>
<td>2</td>
<td>20</td>
<td>70</td>
<td>2nd</td>
</tr>
<tr>
<td>9 Elementary occupations</td>
<td>3</td>
<td>10</td>
<td>25</td>
<td>1st</td>
</tr>
<tr>
<td>0 Armed forces</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Totals</td>
<td>28</td>
<td>116</td>
<td>390</td>
<td></td>
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</tbody>
</table>

more than one occupation. In national circumstances, the number and delineation between occupations will, to a large extent, depend on the size of the economy and the level of economic development, the level and type of technology, work organisation and historical circumstances. For this reason detailed descriptions of the occupations belonging to each of the 390 unit groups have not been developed for ISCO-88. However, a selection is being made among the 1,506 detailed occupational descriptions which were included in ISCO-68. Those found to be still relevant will be published in a companion volume to ISCO-88.

For each of the groups at the four levels of aggregation of ISCO-88 a code number, a title and a brief description of the content is provided. In the case of the unit groups, the main tasks of the occupations belonging to each of them are briefly described and some of the relevant occupational titles are listed as examples. In most cases examples are also given of the occupations which, although related in some way to those belonging to the unit group in question, are classified elsewhere. This has been done in order to clarify possible ambiguities and to highlight the ISCO-88 conceptual approach and characteristics of its structure.

Detailed descriptions of the occupational groups at the four levels of aggregation are followed by the ISCO-88 index of occupational titles. Three separate listings of the index are provided. The first is according to ISCO-88 numerical order, the second by ISCO-68 numerical order, and the third is an alphabetical list of occupational titles. The index reflects the results of a recoding and recasting of the ISCO-68 "Expanded alphabetical list of titles". For further details the reader is referred to the "Notes on the ISCO-88 index of occupational titles" which precede the index.

While revising the index, every effort was made to take into consideration the conceptual and structural differences between the two classifications, and, where possible, to make appropriate modifications, including some new index entries. However, some of the shortcomings of the ISCO-68 index - such as unevenness of detail when naming specialisations relating to a given generic occupational title - have been carried over to the present index. The user should bear in mind that the main aim of the present index is to indicate the content of each group within the ISCO-88 structure, and that the index makes no claim to being exhaustive. The Bureau of Statistics of the ILO intends, by using the latest national sources of occupational titles, to compile an extended and updated version of the ISCO-88 index for later publication. It is hoped that any shortcomings in the present index will be dealt with satisfactorily in the later version.

The following briefly outlines ISCO-88 major groups, and is meant to facilitate the interpretation of the classification. The information given here should not be regarded as a substitute for the more detailed descriptions of occupational groups which the volume contains.

1. Legislators, senior officials and managers

This major group includes occupations whose main tasks consist of determining and formulating government policies, as well as laws and public regulations, overseeing their implementation, representing governments and acting on their behalf, or planning, directing and coordinating the policies and activities of enterprises and organisations, or departments. Reference to skill level has not been made in defining the scope of this major group, which has been divided into three sub-major groups, eight minor groups and 33 unit groups, reflecting differences in tasks associated with different areas of authority and different types of enterprises and organisations.

2. Professionals

This major group includes occupations whose main tasks require a high level of professional knowledge and experience in the fields of physical and life sciences, or social sciences and humanities. The main tasks consist of increasing the existing stock of knowledge, applying scientific and artistic concepts and theories to the solution of problems, and teaching about the foregoing in a systematic manner. Most occupations in this major group require skills at the fourth ISCO skill level. This major group has been divided into four sub-major groups, 18 minor groups and 55 unit groups, reflecting differences in tasks associated with
different fields of knowledge and specialisation.

3. Technicians and associate professionals

This major group includes occupations whose main tasks require technical knowledge and experience in one or more fields of physical and life sciences, or social sciences and humanities. The main tasks consist of carrying out technical work connected with the application of concepts and operational methods in the above-mentioned fields, and in teaching at certain educational levels. Most occupations in this major group require skills at the third ISCO skill level. This major group has been divided into four sub-major groups, 21 minor groups and 73 unit groups, reflecting differences in tasks associated with different fields of knowledge and specialisation.

4. Clerks

This major group includes occupations whose main tasks require the knowledge and experience necessary to organise, store, compute and retrieve information. The main tasks consist of performing secretarial duties, operating word processors and other office machines, recording and computing numerical data, and performing a number of customer-oriented clerical duties, mostly in connection with mail services, money-handling operations and appointments. Most occupations in this major group require skills at the second ISCO skill level. This major group has been divided into two sub-major groups, seven minor groups and 23 unit groups, reflecting differences in tasks associated with different areas of specialisation.

5. Service workers and shop and market sales workers

This major group includes occupations whose main tasks require the knowledge and experience necessary to provide personal and protective services, and to sell goods in shops or at markets. The main tasks consist of providing services related to travel, housekeeping, catering, personal care, protection of individuals and property, and to maintaining law and order, or selling goods in shops or at markets. Most occupations in this major group require skills at the second ISCO skill level. This major group has been divided into two sub-major groups, nine minor groups and 23 unit groups, reflecting differences in tasks associated with different areas of specialisation.

6. Skilled agricultural and fishery workers

This major group includes occupations whose tasks require the knowledge and experience to produce farm, forestry and fishery products. The main tasks consist of growing crops, breeding or hunting animals, catching or cultivating fish, conserving and exploiting forests and, especially in the case of market-oriented agricultural and fishery workers, selling products to purchasers, marketing organisations or at markets. Most occupations in this major group require skills at the second ISCO skill level. This major group has been divided into two sub-major groups, six minor groups and 17 unit groups, reflecting differences in tasks associated with differences between market-oriented and subsistence agricultural and fishery workers.

7. Craft and related trades workers

This major group includes occupations whose tasks require the knowledge and experience of skilled trades or handicrafts which, among other things, involves an understanding of materials and tools to be used, as well as of all stages of the production process, including the characteristics and the intended use of the final product. The main tasks consist of extracting raw materials, constructing buildings and other structures and making various products as well as handicraft goods. Most occupations in this major group require skills at the second ISCO skill level. This major group has been divided into four sub-major groups, 16 minor groups and 70 unit groups, reflecting differences in tasks associated with different areas of specialisation.
8. Plant and machine operators and assemblers

This major group includes occupations whose main tasks require the knowledge and experience necessary to operate and monitor large scale, and often highly automated, industrial machinery and equipment. The main tasks consist of operating and monitoring mining, processing and production machinery and equipment, as well as driving vehicles and driving and operating mobile plant, or assembling products from component parts. Most occupations in this major group require skills at the second ISCO skill level. This major group has been divided into three sub-major groups, 20 minor groups and 70 unit groups, reflecting differences in tasks associated with different areas of specialisation.

9. Elementary occupations

This major group covers occupations which require the knowledge and experience necessary to perform mostly simple and routine tasks, involving the use of hand-held tools and in some cases considerable physical effort, and, with few exceptions, only limited personal initiative or judgement. The main tasks consist of selling goods in streets, doorkeeping and property watching, as well as cleaning, washing, pressing, and working as labourers in the fields of mining, agriculture and fishing, construction and manufacturing. Most occupations in this major group require skills at the first ISCO skill level. This major group has been divided into three sub-major groups, ten minor groups and 25 unit groups, reflecting differences in tasks associated with different areas of work.

0. Armed forces

Members of the armed forces are those personnel who are currently serving in the armed forces, including auxiliary services, whether on a voluntary or compulsory basis, and who are not free to accept civilian employment. Included are regular members of the army, navy, air force and other military services, as well as conscripts enroled for military training or other service for a specified period, depending on national requirements. Excluded are persons in civilian employment of government establishments concerned with defence issues: police (other than military police); customs inspectors and members of border or other armed civilian services; persons who have been temporarily withdrawn from civilian life for a short period of military training or retraining, according to national requirements, and members of military reserves not currently on active service. Reference to a skill level has not been used in defining the scope of this major group.

APPROACHES TO SOME SPECIFIC ISSUES

National differences in educational requirements

However broad the skill level of an international occupational classification may be, the presumed skill level of a particular occupation, or a group of occupations, may not correspond exactly to that determined by the educational requirements of some countries. On the basis of the information received in the course of work on ISCO-88, as well as on the basis of the discussions held by the Fourteenth International Conference of Labour Statisticians, it became apparent that differences in formal educational requirements were most prominent in the cases of some of the teaching, health and social services occupations. In some countries it is necessary/ to have a university degree in order to be able to practise these occupations, while in other countries lower-level educational certificates are considered sufficient. In order to accommodate these differences, parallel occupational groups were created in ISCO-88 Major groups 2 and 3, - Professionals and Technicians and associate professionals, respectively. The codes and titles of these groups are as follows:

Major group 2, Professionals

2230 Nursing and midwifery professionals 2331 Primary education teaching professionals 2332 Pre-primary education teaching professionals 2340 Special education teaching professionals 2446 Social work
professionals

Major group 3, Technicians and associate professionals

3231 Nursing associate professionals 3232 Midwifery associate professionals 3310 Primary education teaching associate professionals 3320 Pre-primary education teaching associate professionals 3330 Primary education teaching associate professionals 3460 Social work associate professionals

This means that, in accordance with educational requirements, when grouping national occupational data according to the ISCO-88 structure, countries will be able to classify nursing, midwifery, teaching and social services occupations either into Major group 2, Professionals, or into Major group 3, Technicians and associate professionals, as appropriate.

Occupations with a broad range of tasks and duties

Differences in the range of tasks and duties belonging to the same occupation are, at national level, mostly determined by the size of the establishment. For instance, in a small establishment typing and filing may be combined with the duties of a receptionist into one single job, while in a bigger enterprise they may constitute two or three separate jobs. At international level, although it is acknowledged that factors such as tradition or collective agreements may play an important part, the existence of these differences is mostly linked to the level of economic development, with its simple patterns of labour division.

Occupational classifications - national as well as international - define occupations, and occupational groups, by reference to the most common combinations of tasks and duties, and therefore face a problem when, in the case of some occupations, the range of tasks and duties does not correspond to those specified in the classification.

In such cases ISCO-88 suggests application of the following rules:

(a) In cases where the tasks and duties performed require skills usually obtained through different levels of training and experience, jobs should be classified in accordance with those tasks and duties which require the highest level of skills. For instance a job which consists of driving a van and delivering goods should be classified in Unit group 8322, Car taxi and van drivers.

(b) In cases where the tasks and duties are connected with different stages of the production and distribution of goods process, tasks and duties related to the production stage should take priority over associated ones, such as those related to the sales and marketing of the same goods, their transportation or the management of the production process - unless one of these tasks and duties predominates. For example, a baker who bakes bread, makes pastries and sells these products should not be classified as a sales person, but as a baker, which means, in ISCO-88 terms, Unit group 7412, Bakers, pastry-cooks and confectionery makers.

Technology and skills

Developments in technology, particularly those which led to mass-production methods, have had a profound effect on the skills that are needed according to whether a product is made by a craft worker or manufactured through the application of one of the latest techniques. For instance, skills required to perform the tasks of a smith or a tailor are different from those required to perform the tasks of a machine-operator in an enterprise engaged in metalworking or in the mass-production of textile garments.

Broadly speaking, a smith or a tailor has to know the materials, tools, sequence of tasks performed, and the characteristics and intended use of the final product. A machine operator, on the other hand, has to know how to use very sophisticated machinery and equipment, how to recognise and signal, or eliminate, problems before they start to affect output in a serious way, or how to react if something goes wrong with
the machine itself. In addition, a machine-operator should have a level of skill and breadth of training which would allow retraining costs to be minimal when product specifications change or when new technology is introduced.

In ISCO-88 the delineation between Major groups 7 and 8 reflects these differences in the type of skills required. Major group 7, Craft and related trades workers, classifies craft-oriented and artisanal occupations - such as mason, carpenter, mechanic, baker, potter, decorative painter, wood-carver - while Major group 8, Plant and machine operators and assemblers, classifies machine-oriented occupations.

Coexistence of two agricultural sectors

Inequalities in the economic development of different countries, or regions within the same country, have resulted in the coexistence of two agricultural sectors, of which one is characterised by low-skilled subsistence farming while the other often has a highly automated production process and, as a result, achieves high productivity with relatively few workers. These differences are reflected in ISCO-88 through a distinction made in Major group 6, Skilled agricultural and fishery workers, between, on the one hand, skilled market-oriented farmers and agricultural workers, and, on the other, those who are engaged in subsistence farming. The aim of this distinction is to reflect important skill differences existing in the two sectors, as well as to improve the quality of the data needed to undertake analyses and make decisions concerning rural development.

Occupations and women

In most countries the number and proportion of women in the labour force has increased over the past two decades, and it is highly probable that this trend will continue. However, this positive numerical increase has not been accompanied by an equal distribution of various jobs between men and women, nor by equal earnings. Women workers tend to cluster in lower skilled jobs, and their wages in most sectors lag behind those of men performing the, same tasks and duties.

Occupation is one of the main variables which denotes the situation of women in the labour force. It is therefore important that occupational categories of a given occupational classification be delineated in a way which will not obscure but promote detail and clarity of information on sex composition of jobs. In ISCO-88 attention is paid to this issue, especially in the case of groups where occupations characterised by the predominance of women workers are classified, such as Major group 4, Clerks, Major group 5, Service workers and shop and market sales workers, and Major group 9, Elementary occupations.

Occupations in the informal sector

The need to identify occupations in the informal sector was taken into consideration in the structure of ISCO-88, especially in the delineation of the unit groups. The following unit groups may be particularly useful for classifying informal sector occupations: Unit groups 7331 and 7332 entitled Handicraft workers in wood and related materials, and Handicraft workers in textile, leather and related materials, respectively, as well as Unit groups 9111, Street food vendors, 9112, Street vendors, non-food products, and 9120, Shoe cleaning and other street services elementary occupations.

Occupations and status in employment

ISCO-88, unlike its predecessor, does not take into consideration whether a worker is a working proprietor or not, as this and similar attributes of the labour force, such as being an employer or an employee etc., reflect status in employment and not the tasks and duties of the worker, and therefore should be dealt with in a separate Status in employment classification.
Technical occupations are classified separately from professional occupations in Major group 3, Technicians and associate professionals. Thus, Technician, biologist classified in Unit group 3211, Life science technicians, while Technician, engineering mining is classified in Unit group 3117, Mining and metallurgical technicians.

Quality inspecting occupations, whose main tasks are to ensure compliance with the quality standards and specifications of manufacturers, are classified in Unit group 3152, Safety health and quality inspectors. On the other hand, testers and checkers, whose main tasks consist of a mechanical inspection of the goods produced which, in most cases, amounts to simple visual checking, are classified with workers producing these goods.

Supervising occupations, as well as those of a foreman/woman, which are mainly concerned with the control of the professional or technical quality of the work done, are classified together with the jobs whose tasks they supervise. However, if the main tasks and duties of a job consist of planning, organising, controlling and directing the daily work activities of a group of subordinate workers, the occupation should be considered as a managerial occupation and classified in the appropriate group belonging either to Sub-major group 12 or 13, Corporate managers or General managers, respectively.

Coaching occupations primarily concerned with on-the-job training by continuous observation, assessment and guidance are classified with the occupations whose workers they instruct, in particular trade, craft or machine-operating tasks.

Teaching occupations mainly concerned with giving private lessons are classified with other teachers at the corresponding institutional level. It should be noted that driving, flying, sailing and related instructors are classified in Unit group 3340, Other teaching associate professionals.

Occupations concerned with research and development are classified according to the field of specialisation in Major group 2, Professionals. When a researcher is also exercising a teaching profession, he or she should be classified as a teacher, at the appropriate educational level.

Apprentices and trainees are classified according to the tasks and duties actually performed, and not, as is the case with some occupational classifications, according to their future occupation.

Comparisons of occupations among countries or regions demand that national occupational statistics be converted to international standards. This is usually achieved by mapping the national occupational categories into a common international classification system, ISCO-88. International comparability of occupational statistics can also be achieved by using the international classification system to recode the original responses elicited by the occupational questions in censuses or other surveys. However, this latter method normally cannot be used because of the high costs involved.

Mapping one classification into another is equivalent to coding each group in the first classification to the most appropriate group in the other. The validity of the mapping is in inverse proportion to the aggregated level at which the mapping is done. That is why it is recommended that mapping should be carried out at the lowest level of aggregation of each of the two classifications, i.e. national occupational classification (NOC) and ISCO-88.

In the process of mapping, the three following situations are those most frequently encountered:
(a) The NOC group, at the lowest level of aggregation, belongs unambiguously to one of the ISCO-88 unit groups. This is, of course, the simplest situation and, if the NOC, both conceptually and structurally, has a base similar to ISCO-88, it is likely to be the most usual situation.

(b) The NOC group, at the lowest level of aggregation, differs in occupational content from the most relevant ISCO-88 unit group, but the difference in the content does not prevent the NOC group from being validly mapped into an ISCO-88 group at one of the higher levels of aggregation. For example: NOC classifies glass engravers and etchers together with glass and ceramics decorative painters in the same lowest level aggregation group, while ISCO-88 classifies these occupations in two unit groups, but in both classifications subsequent aggregation of these occupations is carried out in the same manner.

(c) The way of grouping certain occupations is different in NOC from that applied in ISCO-88, and, as a result, an existing NOC group cannot validly be mapped into any of the ISCO-88 groups. For example: at the lowest aggregation level, NOC classifies farmers, farm managers and farm labourers in one single group, while ISCO-88 classifies these occupations in three separate unit groups belonging to three different minor, sub-major and major groups.

If internationally available occupational statistics have to be produced at the minor group aggregation level of ISCO-88, or any of the higher ones, then no problem arises in the situation described under (b) above. If the information has to be produced at the level corresponding to ISCO-88 unit groups, in that case, as well as in the situation described under (c) above, the following rules should be applied in order of priority as they are described:

- The numerical dominance rule, according to which, on the basis of the additional information available from economic and other statistics, or from sectoral experts, estimates or judgement should be made concerning the relative importance of the occupations classified in the NOC group. If approximately 80 per cent or more of the Jobs classified in the NOC group belong to a particular ISCO-88 group, then the whole NOC group should be classified in this ISCO-88 group.

- The skill level rule, according to which the occupational mix of the NOC group should be analysed on the basis of the ISCO-88 skill-level concept. The mapping into an ISCO-88 group should then be carried out on the basis of the occupations found to be the most skilled.

- The production rule, according to which, for the purposes of mapping into ISCO-88, in the occupational mix of a NOC group production occupations will have priority over sales or managerial occupations.

**Key characteristics**

Skill level references are not made in the definitions of the two major groups entitled Legislators, senior officials and managers and Armed forces respectively, because other aspects of the type of work were considered more important as similarity criteria, i.e. policy making and management functions, and military duties, respectively. As a result there are significant skill level differences between the jobs classified to each of these two major groups. However, the sub major and minor groups of the first major group have been designed to include occupations at similar skill levels.

A distinction is made at the major group level between (a) occupations that are essentially craft oriented (i.e. major group 6 "Skilled agricultural and fishery workers" and 7 "Craft and related trades workers"), and (b) occupations that are essentially oriented towards the operation of tools, machinery and industrial plants (i.e. major group 8 "Plant and machine operators and assemblers") to cope with the issue of different skill requirements for jobs with similar purposes, due to differences in technologies used.

- Occupations which are craft oriented consist of skilled jobs directly involved in the production of goods or
services, where the tasks and duties require an understanding of and experience with the natural resources and raw materials used and how to achieve the desired result. The workers in these jobs may also use more technologically advanced tools and machines, provided that this does not change the basic skills and understanding required for the jobs. Modern machines and tools may be used to reduce the amount of physical effort and/or time required for specific tasks, or to increase the quality of the products.

On the other hand, the tasks and duties of jobs in occupations which are oriented towards the operation of tools, machinery and industrial plants primarily require an understanding of the machines: how to operate them properly, how to identify malfunctioning and what to do when something goes wrong. The skills required are oriented towards the machines and what they are doing rather than to the transformation process as such or its results. Occupations where the tasks and duties consist of assembling products from component parts according to strict rules and procedures are considered to belong to the same major group as the machine oriented occupations. Jobs which only require low or elementary skills and little or no judgement are classified to occupations in major group 9. Occupational groups which require different skill levels (because of differences in the degree of judgement, responsibility and planning) in different countries, and sometimes within the same country, can be classified in different major groups than those assigned in ISCO-88. This possibility was explicitly created for primary, pre primary and special teaching occupations, nursing and midwifery occupations, social work occupations and some artistic occupations.

Jobs with a broad range of tasks and duties are handled by the application of priority rules, i.e. some tasks and duties are given priority in determining the occupational category to which a job should be classified:

- in cases where the tasks and duties are associated with different stages of the process of producing and distributing goods and services, the tasks and duties related to the production stages should take priority over associated tasks and duties, such as those related to the sale and marketing of the same goods, their transportation or the management of the production process (unless either of these associated tasks and duties dominates). For example, the worker who bakes bread and pastries and then sells them should be classified as "baker", not as "sales assistant"; the worker who operates a particular type of machinery and also instructs new workers in how to operate the machine should be classified with the machine operators; the taxi driver who drives his/her own car and also keeps the accounts should be classified with motor vehicle drivers; and

- in cases where the tasks and duties performed require skills usually obtained through different levels of training and experience, jobs should be classified in accordance with those tasks and duties which require the highest level of skill. For example: there are a number of jobs whose tasks and duties most of the time require a set of relatively easily obtained skills, but where the workers are also expected to have skills which require more training or experience, to make it possible to cope with unexpected and infrequent situations, e.g. to avoid accidents or injuries.

**Regional variants of ISCO-88**

ISCO-88(COM) for the European Union (Eurostat)

ISCO-88(CIS) for the Commonwealth of Independent States (CIS Statistical Committee)

ISCO-88(OCWM) Occupational Classification of Workers in Migration under ISCO-88 of ILO/UNDP Asian Regional Programme on International Labour Migration (ILO, Bangkok, 1992)
Introduction and background

1. The objective of this paper is to present ILO=s work with the International Standard Classification of Occupations (ISCO-88) as well as general issues of importance for the creation of data sets using occupation as a central variable for comparative statistical studies of social and economic structures and their changes.

2. Founded in 1919 together with the League of Nations, the International Labour Organisation (ILO) is a specialised agency of the United Nations. One of ILO=s tasks is to develop international standards and guidelines to help countries improve their labour administration as well as the quality, reliability and comparability of their labour statistics. To these ends the need for an international standard classification of occupations (ISCO) was first discussed in 1923 at the First International Conference of Labour Statisticians (ICLS). However, it was only in 1949 at the Sixth ICLS that work to develop ISCO was initiated. As a result the Seventh ICLS (1949) adopted a provisional classification of nine major groups. In 1952 the ILO published the International Classification for Migration and Employment Placement, with detailed descriptions of 1,727 occupations based on the national classifications of eight industrialised countries. At the Eight ICLS (1954) a provisional list of minor groups was approved and the Ninth ICLS (1957) completed the work by endorsing the major, minor and unit groups of the first ISCO. It was published in 1958 as ISCO 58 and included, in addition to the group definitions, descriptions of 1,345 occupational categories within each unit group. The Ninth ICLS recognized that ISCO 58 would need to be revised after a certain time, and a version of ISCO was published in 1968 (as ISCO 68) with a revised structure and an expanded number of described occupational categories (1,506). The third and most recent version, ISCO-88, was adopted by the Fourteenth ICLS in November 1987 and approved by the ILO=s Governing Body in February 1988.

3. ISCO-88 was immediately made available to users in English, French and Spanish, and has, since 1990-91, been available as printed volumes as well as on diskette, see ILO (1990). Also available on diskette is a set of descriptions of more detailed occupational categories than those included in ISCO-88. These descriptions were adapted from those in ISCO-68 with only limited updating.

4. ILO material on work with occupational classifications can be found in Embury et al (1997) and Hoffmann et al (1995), as well as in Hussmanns et al (1992), chapter 10; in Chernyshev (1994), chapters 22, 23 and 24, and in United Nations & ILO (forthcoming), chapter 3. A list of ISCO-88 major, sub-major and minor groups is presented on the web-site http://www.ilo.org/public/english/120stat/class/isco.htm, from which a hyper-link is provided to the corresponding web-site of the Institute of Employment Research (IER) at the University of Warwick for information about ISCO-88(COM), the version of ISCO-88 developed by IER for Eurostat. In the future we also hope to establish such links also to corresponding national sites, as part of the plan to establish the ILO site as the main door of entry into the world of occupational classifications, as well as to the occupational classifications of the world.

5. As custodian of ISCO-88 ILO has provided advice for three efforts to develop common regional classifications based on ISCO-88: (i) ISCO-88(COM); (ii) ISCO-88(CIS) developed for the Statistical Committee of the Commonwealth of Independent States (CIS STAT) and (iii) ISCO-
88(OCWM) developed for the ILO/UNDP Asian Regional Programme on International Labour Migration. Up to the end of 1998 there had been direct contacts with the relevant authorities in 53 countries and territories which have developed, or were in the process of developing, national occupational classifications using ISCO-88 as a model or the same principles. There had also been contacts with the authorities in nine countries where it has been decided to use another model when revising the national classification, usually that of the previous one. Advisory visits had been made to 19 countries and officials from two countries had visited the ILO. National and regional training seminars were organized for China, Costa Rica, Kyrgyzstan and Thailand as well as for CIS member states, South East Asian countries and South Pacific countries. Countries where a national classification based on ISCO-88 has been developed with the assistance of an ILO sponsored or back-stopped resident expert include Trinidad & Tobago, Tanzania, Namibia, Mauritius and Fiji. We know that 65 countries with a population census in the 1989-94 period established links to ISCO-88 for presentation of their latest census results while 33 countries linked the results to ISCO-68. For the 2000 round of Population Censuses it has been recommended that countries should be able to link the statistics on >occupation= to ISCO-88, see United Nations (1998) and UN/ECE et al (1997). In the statistics submitted for the 1999 edition of the ILO Yearbook of Labour Statistics 51 countries and territories are represented with employment and/or unemployment statistics according to ISCO-88 major groups, mostly from Labour Force Surveys and registrations by employment services (up from 43 in 1998 and 37 in 1997).

What is an occupational classification?

6. An occupational classification is a tool for organising all jobs in an establishment, an industry or a country into a clearly defined set of groups according to the tasks and duties undertaken in the job. It will normally consist of two components:

a descriptive component, which may be just a set of titles of occupations and occupational groups, but which usually consists of descriptions of the tasks and duties as well as other aspects of the jobs which belong to each of the defined groups. These descriptions can be said to constitute a dictionary of occupations;

the classification system itself, which gives the guidelines on how jobs are to be classified into the most detailed groups of the classification and how these detailed groups are to be further aggregated to broader groups. This classification system represents a value set for the variable >occupation=, a variable which describes the different tasks and duties of jobs.

7. Occupational classifications can be compared to a system of maps for a country, say Germany: the top level of aggregation corresponds to a small scale road map for the main motorways and highways; the next level corresponds to a set of larger scale maps for say each of the main regions, also showing provincial and local roads; and so on. At the most detailed level will be the detailed technical maps used by municipal engineers to plan sidewalks, traffic lights, road extensions, etc. Such detailed technical maps can be compared to the job descriptions which are used by enterprises for personnel management and wage systems which in most countries will not be the concern of national authorities, except for the management of public sector employees.

What are occupational classifications used for?

8. National occupational classifications and dictionaries are usually designed to serve several purposes. Although the detailed occupational descriptions and the classification structure must be seen as two parts of an integrated whole, different user areas have different degrees of interest in the
various elements. Detailed occupational descriptions are used by those who need to know about the tasks, duties and working conditions of jobs, i.e. mainly by client oriented users broadly speaking, (i.e. those responsible for job placement, vocational training and guidance, migration control, etc.). The occupational descriptions should be designed primarily to meet the needs of such users, but must also include the descriptive elements necessary for applying relevant aggregation schemes. The classification structure, i.e. the grouping of the detailed occupations together in progressively more aggregate groups, should be designed mainly to facilitate the sorting of jobs and persons into groups, i.e. for the matching of job seekers and vacancies, or for statistical description and analysis of the labour market and the social and economic structure of society.

9. Legislators and public sector administrators use occupational statistics in support of the formulation and implementation of economic and social policies and to monitor progress with respect to their application, including those of manpower planning and the planning of educational and vocational training. Managers need occupational statistics for planning and deciding on personnel policies and monitoring working conditions, at the enterprise and in the context the industry and relevant labour markets. Psychologists study the relationship between occupations and the personality and interests of workers. Epidemiologists use occupation in their study of work related differences in morbidity and mortality. Sociologists use occupation as an important variable in the study of differences in life styles, behaviour and social positions. Economists use occupation in the analysis of differences in the distribution of earnings and incomes over time and between groups, as well as in the analysis of imbalances of supply and demand in different labour markets. Depending on the purpose of the study, "occupation" may be regarded as the main variable in the empirical analysis, or it may serve as a background variable. Used as a background variable, it may serve as a proxy for other variables such as >socio economic groups< or >working conditions<, or it may be used as one element in the construction of other variables, such as >social class< or >socio economic status<. The resolution needed for the value set to satisfy these different areas of use, i.e. the degree of detail in the classification, will differ dramatically: from the distinction between just two groups popular with some journalists, sociologists and the managers of the former Soviet Union (Amanual@ v. Anon-manual@ or Awhite-collar@ v. Ablue-collar@) to the more than 10,000 described in the U.S. Dictionary of Occupational Titles.

10. ISCO is intended to facilitate international communication on the subject of occupations and occupational groups, narrowly or broadly defined, both for client oriented and for statistical users. ISCO should therefore lend itself to the different uses at the national level, while taking into account the special considerations which must follow from its international nature.

11. Internationally comparable statistics on occupational groups are used mainly to:

(a) compare the distribution of the employed population or some other variable (e.g. wages, hours of work, work accidents, income, consumption, reading habits) over occupational groups in two or more countries;

(b) compare data on broadly or narrowly defined individual sets of occupations in two or more countries, e.g. to compare the average wages of >computer programmers< in country A with those in country B, or to compare the number of >industrial designers< in the two countries;

(c) merge data from different countries referring to comparable groups, e.g. to obtain enough observations to study the incidence of particular work related accidents or diseases among workers in broadly or narrowly defined occupational groups, believed to have similar exposure to particular working conditions or harmful substances.
Experience shows that at the international level, many users of occupational statistics need data at the highest level of aggregation usually for descriptions of type (a). Important exceptions are international studies of wage rates, earnings, work hazards and injuries and other conditions of work: such studies often require that detailed occupational groups can be defined consistently, sometimes in cross classification with other variables such as >industry= and/or >status in employment=.

12. It is important to note that while the statistical use of type (a) above requires that the occupational classification cover all types of jobs, the focus in other types of use (statistical or client oriented) is on specific occupations or groups of occupations. In total the sum of all such users= areas of interest could conceivably also cover all occupations, but in practice they will only cover a sub set.

13. The main client oriented application of an international standard classification of occupations is in the international recruitment of workers and in the administration of short or long term migration of workers between countries. An internationally developed and agreed set of descriptions for detailed occupational categories which can serve as a common "language" for the countries and parties involved in such programmes may greatly increase the effectiveness of the communication necessary for their execution.

14. When the responsible agency in a country needs a model to serve as basis for developing or revising the national classification, or when a substitute for a national classification is needed in countries that have not developed their own, then an international standard classification may be a good alternative. These applications have been kept in mind both in the original development of ISCO and in its subsequent revisions.

**Key characteristics of ISCO 88**

15. The last revision of ISCO aimed to produce an international classification which would:

- have a stronger and more clearly stated conceptual basis to strengthen its usefulness as a descriptive and analytical tool and to make it easier to update;

- reflect the labour markets of developing as well as of industrialised countries, covering the >informal= as well as the >=formal= parts of the world of work;

- reflect better than before women's positions in the labour market;

- reflect occupational consequences of different technologies;

- incorporate new occupations and reflect shifts in the relative importance of occupational groups.

16. In the context of ISCO-88 a job is defined as Aa set of tasks and duties which are (or can assigned to be) carried out by one person@. Most occupational classifications classify, i.e. group jobs together in occupations and more aggregate groups, by the similarity of (some aspect of) the type of work done in these jobs. Persons are classified by >occupation= through their relationship to a past, a present or a future job. In ISCO 88 occupations are grouped together and further aggregated mainly on the basis of the similarity of skills required to fulfill the tasks and duties of the jobs. Two dimensions of the skill concept are used in the definition of ISCO 88 groups: Skill level, which is a function of the range and complexity of the tasks involved, where the complexity of tasks has priority over the range; and skill-specialisation, which reflects type of knowledge applied, tools and
equipment used, materials worked on, or with, and the nature of the goods and services produced. It should be emphasised that the focus in ISCO 88 is on the skills required to carry out the tasks and duties of an occupation and not on whether a worker in a particular occupation is more or less skilled than another worker in the same or other occupations.

17. Only a few broad "skill level" categories can usefully be identified for international comparisons. The 1976 version of the International Standard Classification of Education (ISCED) was used to define the ISCO-88 skill levels, but these definitions can easily be re-formulated with reference to the revised ISCED-1997. This formulation of the definitions does not mean, however, that skills can only be obtained by formal education or training. Most skills may be, and often are, acquired through experience and through informal training, although formal training plays a larger role in some countries than in others and a larger role at the higher skill levels than at the lower see also paragraph 24 below. For the purpose of the ISCO classification system, determining how a job should be classified is based on the nature of the skills that are required to carry out the tasks and duties of the job not the way these skills are acquired. Nor is it relevant that the job incumbent may have skills not demanded by the job.

18. "Skill specialisation" can be indicated both broadly and more narrowly and is related to subject matter areas, production processes, equipment used, materials worked with, products and services produced, etc. The words used to describe subject matter, production processes, etc. therefore have to be used as labels for the core sets of skills with which occupations are concerned. The same type of words may be used to describe the type of activity, i.e. the industry, of the production unit. For some workers it will therefore be possible to "predict" the occupation in which they are working with a fairly high degree of success, knowing how they are classified by industry. This does not mean that ISCO is using industry as a classification criterion (except in a few cases where it is directly relevant), only that skills in fact are linked to products, materials, etc. which are the determinants of the industry of the establishment in which the work is carried out. The conceptual difference between the two types of classifications should not be forgotten, even though it may be partly obscured by the correlation between them and by the terminology used.

Table 1: ISCO-88 major groups, the number of sub-groups and skill level
As shown in table 1 ISCO 88 defines four levels of aggregation, consisting of:

10 major groups
28 sub major groups (subdivisions of major groups)
116 minor groups (subdivisions of sub major groups)
390 unit groups (subdivisions of minor groups)

Unit groups will consist of a number of detailed occupations. For example, as a separate occupation nuclear physicist belongs to ISCO 88 unit group 2111 Physicists and astronomers, which belongs to minor group 211 Physicists, chemists and related professionals, which is part of sub major group 21 Physical, mathematical and engineering science professionals of the major group 2 Professionals.

Eight of the ten ISCO 88 major groups are delineated with reference to the four broad skill levels, see table 1. Five of the eight major groups, i.e. 4, 5, 6, 7 and 8, are considered to be at the same broad skill level and are distinguished by reference to broad skill specialisation groups.

Skill level references are not made in the definitions of the two major groups entitled Legislators, senior officials and managers and Armed forces respectively, because other aspects of the type of work were considered more important as similarity criteria, i.e. policy making and management
functions, and military duties, respectively. As a result there are significant skill level differences of the jobs classified to each of these two major groups. However, the sub major and minor groups of the first major group have been designed to include occupations at similar skill levels.

22. A distinction is made at the major group level between (a) occupations that are essentially craft oriented (i.e. major group 6 "Skilled agricultural and fishery workers" and 7 "Craft and related trades workers"), and (b) occupations that are essentially oriented towards the operation of tools, machinery and industrial plants (i.e. major group 8 "Plant and machine operators and assemblers") to cope with the issue of different skill requirements for jobs with similar purposes, due to differences in technologies used.

23. Occupations which are craft oriented consist of skilled jobs directly involved in the production of goods or services, where the tasks and duties require an understanding of and experience with the natural resources and raw materials used and how to achieve the desired result. The workers in these jobs may also use more technologically advanced tools and machines, provided that this does not change the basic skills and understanding required for the jobs. Modern machines and tools may be used to reduce the amount of physical effort and/or time required for specific tasks, or to increase the quality of the products. On the other hand the tasks and duties of jobs in occupations which are oriented towards the operation of tools, machinery and industrial plants primarily require an understanding of the machines: how to operate them properly, how to identify malfunctioning and what to do when something goes wrong. The skills required are oriented towards the machines and what they are doing rather than to the transformation process as such or its results. Occupations where the tasks and duties consist of assembling products from component parts according to strict rules and procedures are considered to belong to the same major group as the machine oriented occupations. Jobs which only require low or elementary skills and little or no judgement are classified to occupations in major group 9.

24. The 14th ICLS decided that for international comparisons it should be possible to reflect in ISCO the important differences which exist between countries, and sometimes within a country, in the required skill levels of jobs which traditionally have been seen as belonging to the same occupational group. Such differences are linked to the actual tasks which are carried out as these, although similar in nature, may vary significantly in the degree of judgement, responsibility and planning required. These differences in tasks will have resulted in national differences in skill levels and qualifications required for entering the occupations. The 14th ICLS therefore decided that ISCO 88 should make it possible for countries to classify some occupational groups either to major group 2 "Professionals" or to major group 3 "Technicians and associate professionals", depending on national circumstances. This possibility was created for primary, pre primary and special teaching occupations, nursing and midwifery occupations, social work occupations and some artistic occupations.

25. The 14th ICLS also decided that, as in ISCO 68, jobs in the armed forces should be classified in a separate major group 0 "Armed forces", even if the jobs involve tasks and duties similar to those of civilian counterparts. However, many national classifications, otherwise based on ISCO-88, follow the original secretariat proposal to classify such jobs with their civilian counterparts.

26. All occupations which consist of jobs in which the workers have mainly legislative, administrative or managerial tasks and duties should be classified to major group 1 "Legislators, senior officials and managers". In ISCO 68 they were partly classified to major group 2 (AAdmiministrative and Managerial Workers@) and partly to other major groups.

27. "Working proprietors" are to be classified according to whether their tasks and duties are mainly
similar to those of managers and supervisors or to those of other workers in the same area of work. This is because the status of "working proprietor" is seen as related not to type of work performed but to "status in employment" corresponding to the "self employed" and "employer" categories of the International Classification of Status in Employment (ICSE). One self employed "plumber" may have mainly managerial tasks and another may carry out the tasks of "plumber" with very few managerial responsibilities, depending for example on the size of the firm. In ISCO-88 the former job should be classified with managers and the latter with A7136 Plumbers and pipe fitters.

28. In ISCO 88 both "apprentices" and "trainees" should be classified according to their actual tasks and duties as, if needed, these two groups may be separately identified through the "status in employment" classification. ISCO 68 recommended that apprentices should be classified to the occupation for which they are being trained, but that trainees be classified according to their actual tasks and duties.

29. The problem of classifying jobs which have a broad range of tasks and duties should be handled by the application of priority rules, i.e. some tasks and duties are given priority in determining the occupational category to which a job should be classified:

(a) in cases where the tasks and duties are associated with different stages of the process of producing and distributing goods and services, the tasks and duties related to the production stages should take priority over associated tasks and duties, such as those related to the sale and marketing of the same goods, their transportation or the management of the production process (unless either of these associated tasks and duties dominates). For example, the worker who bakes bread and pastries and then sells them should be classified as "baker", not as "sales assistant"; the worker who operates a particular type of machinery and also instructs new workers in how to operate the machine should be classified with the machine operators; the taxi driver who drives his/her own car and also keeps the accounts should be classified with motor vehicle drivers; and

(b) in cases where the tasks and duties performed require skills usually obtained through different levels of training and experience, jobs should be classified in accordance with those tasks and duties which require the highest level of skill. For example: there are a number of jobs whose tasks and duties most of the time require a set of relatively easily obtained skills, but where the workers are also expected to have skills which require more training or experience, to make it possible to cope with unexpected and infrequent situations, e.g. to avoid accidents or injuries.

It is recognised that a certain amount of judgement and adjustment to national circumstances will be necessary in the choice and application of these priority rules.

30. Many users of ISCO-68 had found that its top aggregation level of nine groups meant that the differences within each group were too large for the groups to be useful for description and analysis. However, the next level of aggregation, with 83 groups, represented too much detail for many types of analysis, as well as for international reporting of occupational distributions, especially if the data are obtained through sample surveys. ISCO 88 therefore includes 28 "sub major" groups as a new level in the aggregation system between the former major and minor groups, see table 1.

31. In all areas of statistics it is important to achieve a balance between continuity of time series and needed adjustments and improvements in definitions, in methods of data collection and in classification systems. In developing ISCO 88, continuity was aimed for at the unit group level. The revision did, nevertheless, result in the splitting of a significant number of ISCO 68 unit groups. The numerical importance of many of these splits at the country level need not be important.
32. The unit group level is the most detailed level specified in the ISCO 88 structure. The previous versions of ISCO also specified a detailed set of occupational categories, although they were not discussed or approved by the respective ICLS. Upon request, adapted versions of those of the detailed ISCO 68 descriptions which are still relevant are made available to the users of ISCO 88 on diskette.

33. The emphasis on skill level and skill specialisation as the main similarity criteria for the delineation of occupational groups in ISCO 88 is not such a dramatic change from ISCO 68 and related national classifications as it may seem. That skill was implicitly used in ISCO 68 can be seen through a closer analysis of its classification system. For example, the group 0/1 (>Professional, Technical and Related Workers=) contains occupations with tasks and duties which require, for the most part, highly trained or skilled workers. Occupations of comparable skill requirements are otherwise only found in its major group 2 "Administrative and managerial workers". Each of the other major groups in ISCO 68 covers different broad areas of skill specialisation. For example, most of the occupations in major group 3 "Clerical and related workers" mainly require skills needed to deal with data and information, while most of the occupations in major groups 4 and 5 "Sales workers" and "Service workers" can be said to mainly require skills needed in dealing with people. Similarly the distinctions between different minor and unit groups within a major group can be seen as distinctions between different skill specialisations. Skill level is explicitly discussed in the introduction to ISCO 68 in relation to minor group 9 9 (>Labourers not elsewhere classified=). The conclusion that skill implicitly plays an important role in both ISCO 58 and ISCO 68 is also supported by the following quotation from the Introduction to ISCO 58:

... combinations (of occupations) may be based on materials worked on, workplace, environment, the specialised equipment used (if any) and similar relationships. The particular skills, knowledge and abilities of the workers concerned have an intimate connection with such factors.

34. When coding ISCO 68 groups to ISCO 88 we found that 55 per cent of the ISCO 68 unit groups (157 out of 286) had been left unchanged or have had their scopes only slightly expanded or reduced. Fourteen of the new unit groups had been created by combining two or three ISCO 68 unit groups using a total of 31 such groups. The coding also showed that 96 ISCO 68 unit groups were split and that the parts were coded to 174 different ISCO 88 unit groups. Twenty four of the split groups were "not elsewhere classified" groups. A total of 32 ISCO 88 unit groups contain no reference to any ISCO 68 unit groups or occupational categories.

Creating comparative occupational statistics

35. Above it was mentioned that in the 1998 Yearbook of Labour Statistics for 43 countries one can find statistics on employment and/or unemployment according to the major groups of ISCO-88. This, however, only means that these statistics are being presented according to a standard format, consistent with ISCO-88. It does not necessarily mean that they are comparable to a degree which will satisfy most of serious users of such statistics. To understand the reason for this one must recognize that statistical series only will be "completely comparable" between different geographic regions (or over time) if the survey operations upon which they are based satisfy the following conditions:

a. The populations covered have been defined and delineated in the same way.
b. The concepts (variables) to be measured have been defined in the same way.
c. The same type of data collection instrument has been used.
d. The reference periods are the same.

e. The questions used in the survey questionnaires are understood in the same way by the respondents, and the training, instructions, other support and supervision of the data collectors are equivalent, as are the editing and processing procedures.

f. The distribution variables at the most disaggregated level and the response categories are the same.

g. The sampling frame and units, the sampling procedures and the estimation procedures - including procedures for dealing with non-response - are the same.

36. In other words, the "norm" is an integrated survey operation covering all the regions to be compared. Even where examples of approximations to such survey operations exist, e.g. as cooperative efforts among researchers in different countries, the data processing procedures are normally not standardized and documented as well as the value sets for the variables and the procedures used to collect the information will be, i.e. question formulations and sampling procedures. However, processing procedures, and in particular coding, are important for the quality of occupational data, and therefore also for the comparability of the resulting statistics. This has been documented in e.g. Campanelli et al (1997). A simple, but flawed, indicator of the quality of coding is the reliability rate (i.e. the rate of consistency between different coders of the same material), which typically will tend to be around 0.8 for >occupation=. As all coders involved in a quality test may have made a mistake relative to a Atrue@ value, this will be a low estimate of an Aerror rate@. Thus it is important to use procedures for coding which may reduce significantly the number of errors made.

37. In official statistics the national labour force surveys (LFS) in many ways can be said to represent an approximation to the same survey format because of their use of a common set of basic concepts and variables as well as similar survey procedures, see e.g Lawrence, 1999. This applies in particular to the LFSs which follow the specifications given by Eurostat for the European Union Labour Force Survey (ELFS). However, there is little evidence that those responsible for these surveys have in fact taken all the steps possible and necessary to ensure a reasonable degree of comparability with respect to the occupational statistics to be derived from the results, even when these results are presented according to ISCO-88 or some other common value set, see e.g. Birch & Elias (1997). Even when pains have been taken to satisfy condition f. indicated above, little attention seems to have been given to condition e. with respect to the Aoccupation@ variable.

38. Comparable statistics with data of low reliability is a self-contradiction. Therefore the first objective if one wants to compare occupational statistics must be to ensure that the data being compared have been measured reliably. The studies quoted above do not really provide the components of a total quality model for occupational statistics, but based on them and more general methodological considerations the following elements would seem to be important, see e.g. Hoffmann et al (1995) for a more detailed discussion:

(a) the surveys should use one or more questions which will ensure that the respondent provides the type of information which can be used to identify and code the Aoccupation@ of the selected job. Such question(s) should usually ask about the job title and the main tasks and duties of the job, not about Aoccupation@ which is a term often interpreted by respondents to mean the type of work they were trained for.

(b) The information provided by the respondents should be coded by using coding indexes which reflect the type of responses which are given to the question(s) used. The indexes should be organised to support the rules for coding, see (c) below, and the index items should have references
to the codes of all relevant classifications.

(c) Coding should be to the most detailed level of the classification supported by the responses given, to preserve as much as possible of the information provided. That some codes may not appear frequently enough to warrant separate presentation when publishing the results should be dealt with during the preparation of tables, not as part of the coding process. Coding to a pre-defined Alevel@ in the coding structure is inappropriate as the size of the groups defined at that level will vary significantly in most national occupational classifications as well as in ISCO-88. Therefore the best coding strategy will normally be to register the coding index entry identified as best representing the response. This will ensure Acoding to the most detailed level@, and will make it possible to leave the choice of the most relevant classification to when one is making the tables.

(d) If coding to a common classification cannot be done during the initial coding process, then the mapping from the original codes to e.g. ISCO-88 should be done from the most detailed level of the classifications used, even if the data are not available at that level. Reliable mapping cannot be made on the basis of group titles alone, especially if some of them are translated from the original language, but must be based on an examination of the specified tasks and duties in the respective groups. The mapping at this level should be the basis from which one should construct the links for the data available, see Hoffmann (1994) for an elaboration.

39. While not sufficient to ensure good quality and comparable occupational statistics, the use of a common value set of occupational groups and carefully constructed coding indexes and rules are certainly necessary tools. The HISCO project, see van Leeuwen, Maas et al (1999), represents an interesting effort to ensure that these tools are being developed for the study of historical materials, through joint discussions between participating researchers on the best way to construct coding indexes and procedures to be used for historical records providing occupational information for different periods and in different countries. The best available discussion on the problems one faces, both possibilities and limitations, when such tools have not been applied when producing the available statistics, can be found in Anker (1998): in particular in chapter 4 but also in chapter 11 and elsewhere in the book.

40. The validity of the above arguments is independent of the particular common classification chosen, and e.g. both Anker (1998) and the HISCO project use ISCO-68 as the common classification. For Anker the reason is simple: most of the national data sets he used were based on (national variants of) ISCO-68, both because most sets pre-dated ISCO-88 and because it always takes considerable time for a new international standard to be implemented. For the HISCO project the advantage of using ISCO-68 instead of ISCO-58 or ISCO-88 is not evident, and the choice may have been more a result of the familiarity of the initiators of the project with this classification than the result of a careful evaluation of possible alternatives. The choice of ISCO-88 as the >common denominator< for comparative studies where >occupation< is an important variable has to be based on an evaluation of whether the distinctions it makes are relevant for the issues to be explored and of the extent to which it corresponds to the classifications used in the sources upon which the studies will be based. Even when the former consideration does not point clearly to ISCO-88 the latter may do so, as indicated in the information about the penetration of ISCO-88 in national statistical practice given in paragraph 4 above. There is reason to expect that the use of or mapping to ISCO-88 will be more widespread in the 2000 round of population censuses than in the 1990 round, as a consequence of the longer period of adaptation of national practices. It may also have an effect that the ILO and the United Nations Statistics Division together have prepared a guide on how to implement the recommended economic activity variables in population censuses, see United Nations & ILO (forthcoming).
Occupation (and ISCO-88) is necessary but not sufficient

41. It is generally recognized that for adequate descriptions and analysis of the world of work and its social and economic context and consequences it is necessary, but not sufficient, to be able to describe the type of work being carried out (i.e. the occupation). Among the background variables which are needed in addition are (i) the type of activity within which the work is being carried out (i.e. the industry); and (ii) the contractual conditions of the work (i.e. the status in employment). Thus the UN recommendations for population censuses have always included that these variables should be measured for the economically active population, see e.g. United Nations (1998).

42. Social stratification and social mobility are important areas for social research which also correspond to important social and political concerns about inequalities of opportunities and results, as well as about their reproduction over life cycles and generations, see e.g. Erikson & Goldthorpe (1993). Central tools in such areas of analysis are typologies of social class or socio-economic groups. Whereas the distinctions between various groups in these typologies have been given a variety of theoretical justifications their operationalisations have normally relied upon the variables occupation, industry and status in employment, usually with the former as the most important element and with all variables represented with very limited value sets. Sometimes these variables are supplemented with variables such as educational attainment and type of authority at work-place. Some of these typologies have separate classification rules for persons who are not economically active, such as main source of livelihood.

43. Some researchers have criticised ISCO-88 for not incorporating status-in-employment aspects, i.e. for not being more of a socio-economic classification. The above presentation of ISCO-88 has hopefully explained why this is so. Ganzeboom & Treiman (1996) says that this ... may diminish the applicability of ISCO-88 for practical reasons. Securing additional information on employment status usually will require additional survey questions. This argument ignores the fact that information about the status-in-employment situation about a job does not come spontaneously when asking for its main tasks and duties, the information needed to code occupation. Thus when the status-in-employment distinctions are incorporated into the occupation classification used, one or more separate questions may have to be asked to obtain the information needed for correct coding. This is clearly demonstrated e.g. by the questionnaire used for the last French census.

44. In this context it is also relevant to observe that it is surprising that little or no attention is paid to the problems of determining the borderline between paid employment and self-employment, i.e. in the intermediary contractual situations which many workers find themselves. To do so would be particularly pertinent in developing and transition economies were such situations are more prevalent than in the traditional market-oriented, industrialized economies. However, anecdotal information suggests that new contractual forms and borderline situations are becoming more common also in the latter. Some of these forms and situations are well known: e.g. owner-managers of incorporated businesses and taxi-drivers whose contract with the owner of a taxi-licence or car in effect means that they rent their means of production and effectively carry (most of) the economic risks of self-employment, even though they may consider themselves to be employees. Other borderline situations are represented by day labourers who (may) have to sell their services to a (new) employer on a daily basis; franchisees who invest a considerable amount of capital in the work-place, but who have limited operational freedom; and the dependent contractors who for tax purposes are registered as self-employed but whose work situations correspond to those of employees. ILO (1993) has a non-exhaustive list of different
borderline situations and chapter 3 in ILO (1998) describes the lack of concern with such issues in national statistical offices, as found in a 1998 ILO survey of their practices. However, Rose & O=Reilly (1998) calls for further work on these issues.

The future of ISCO-88

45. When the proposal for the conceptual framework for ISCO-88 was prepared one hoped that one benefit would be to make it easier to retain the classification=s basic structure and principles for a long period, and to ensure that occupational consequences of the continuous changes could be taken care of within this structure through a process of up-dating within and extension of the established structure. Unfortunately, systematic work to up-date and extend ISCO-88 has been modest, even though the World Health Organization has provided new descriptive definitions for the following groups defined for nursing occupations: 223, 2230, 323, 3231, 3232 and 5133. In the future these and other updated descriptions will be found on the ILO web-site as they are being developed.

46. There are two main reasons for the lack of progress in up-dating ISCO-88: (i) The limited resources devoted to ISCO-related work. About one work-year per year, divided between two persons, have been allocated to this work in the ILO and most of the efforts have had to be devoted to providing guidance on understanding of ISCO-88, as well as on the development of national standard classifications of occupations (NSCO) and on the effective use of the NSCO to obtain reliable occupational statistics. (ii) As custodian of ISCO-88 ILO is even further removed from the realities of the world of work which the classification is supposed to reflect than are the custodians of NSCOs. On a world-wide basis these realities are also much more varied than those of a national labour market. Thus, even if ILO had allocated ample human and financial resources for this work one would be faced with difficult methodological issues: Where do we find relevant information, given that few national custodians have established systematic procedures for updating their NSCOs, and that those who have do not necessarily inform ILO about their activities and findings? What are the criteria by which we can judge whether a reported development is (sufficiently) significant and widespread to be reflected in ISCO-88?. Do we need to make such judgements?

47. In the face of these problems the ILO=s short term strategy will continue to be one of Amuddling through@: Proposals for up-dating and extending the ISCO-88 classification structure may take several forms:

(a) A number of more detailed occupational classes may be presented as subdivisions of appropriate ISCO-88 unit groups, with a two digit extension to the unit group code: "-xy". Such extensions will be proposed where it has been made clear that international exchange of occupational information, including statistics, on these groups will warrant their separate identification within the ISCO-88 structure. This may happen e.g. (i) at the initiative of e.g. international federations of organizations of people working in particular professions who can make a case for the separate identification of these professions in ISCO-88 as important for the international recognition of such occupations ; (ii) because new occupations have emerged as a consequence of technological developments common to a number of countries; or (iii) because exchange of information between several countries for e.g. recruitment, job placements and the international migration of workers will be facilitated by references to detailed standard occupational classes.

(b) Regional adaptations of ISCO-88 may introduce new unit and/or minor groups to the ISCO-88 structure, to bring together and highlight some important categories of occupations which in ISCO-88 are "hidden" in one or more unit groups, or which it is difficult to place within the ISCO-88 structure .
We expect that an ISCO-dedicated web-site, which we hope to establish before the end of 1999, will be our main channel of communication with those who are closer than we are to the world of work. The web-site will be used to display answers to queries on ISCO-88 and its use, as well as proposals for up-dates and extensions. We hope to establish hyper-links to similar web-sites for NSCOs. The results of these efforts will be presented to the 17th International Conference of Labour Statisticians (ICLS), tentatively scheduled for 2003-04, with an invitation for the delegates to ICLS to consider whether proposals for a comprehensive revision of ISCO-88 should be prepared for discussion at the 18th ICLS in 2008-09. Obviously, all this will depend on whether a minimum of qualified staff and other resources will be allocated to the relevant activities.

48. As the ILO also is the custodian of ICSE-93 efforts will be made to explore further the issues referred to in paragraph 44 above, hopefully on the basis of research and experiences from developing and transition countries, as well as from the OECD countries which normally have the strongest statistical organisations as well as the best capacity for relevant academic research on these issues.

**Concluding remarks**

49. It is a major task to collect, organize, analyse and summarize effectively the large amount of information on the work which people do which is needed to construct a national occupational classification which will be and remain a reasonably faithful reflection of the world of work of the country. To judge whether ISCO-88 manages the even more formidable tasks of serving as a common denominator and model for such national classifications in a manner which is good, bad or indifferent is not up to its architect and custodian, but for the various users of this tool, this Amap@ of the world of work; and their judgement will differ as a function of what they want to use the tool for. What is clear, however, is that the combination of low commitment of resources to this type of map-making, both in countries and in the relevant international and regional organisations, as well as the complexity of the subject matter, does create a situation where ISCO-88 is and will continue to be, the dominant alternative for those who want to carry out cross-national comparisons of occupational data (to be) collected over the 20-25 year period stretching from about 1990 to about 2010-15, even if a new version of ISCO should be adopted by a 17th ICLS in 2008.

50. Given this Afact of statistical life@, the challenge to ILO as the custodian of ISCO is to make sure that ISCO-88 stays updated and that users are informed about the most effective ways of using this complex tool. The challenges to the users of ISCO-88 is (i) to make sure that they are using the tool as effectively as possible; (ii) to share with the ILO the problems and experiences with using ISCO-88, because this is the major possibility for the ILO to learn what it needs to know to improve ISCO-88; and (iii) to put pressure on the ILO to honour its obligations as custodian. Such pressure can be applied directly by contacting the ILO Bureau of Statistics, as well as indirectly through the representatives in the ILO bodies which determines its priorities, work-programme and budget. As one important group of users of ISCO-88 based or linked statistics social scientists as individuals and as a group should be concerned about the development of this tool, should make their requirements known to the tool-makers, and should contribute to improvements and effective use of national occupational classifications as well as ISCO-88.

**References:**

51. Nordisk statistisk sekretariat, København, 1990


MAJOR, SUB-MAJOR, MINOR AND UNIT GROUP TITLES

MAJOR GROUP 1: LEGISLATORS, SENIOR OFFICIALS AND MANAGERS

11 LEGISLATORS AND SENIOR OFFICIALS

111 LEGISLATORS

1110 Legislators

112 SENIOR GOVERNMENT OFFICIALS

1120 Senior government officials

113 TRADITIONAL CHIEFS AND HEADS OF VILLAGES

1130 Traditional chiefs and heads of villages

114 SENIOR OFFICIALS OF SPECIAL-INTEREST ORGANISATIONS

1141 Senior officials of political-party organisations

1142 Senior officials of employers', workers' and other economic-interest organisations

1143 Senior officials of humanitarian and other special-interest organisations

12 CORPORATE MANAGERS (This group is intended to include persons who - as directors, chief executives or department managers - manage enterprises or organisations, or departments, requiring a total of three or more managers.)

121 DIRECTORS AND CHIEF EXECUTIVES

1210 Directors and chief executives

122 PRODUCTION AND OPERATIONS DEPARTMENT MANAGERS

1221 Production and operations department managers in agriculture, hunting, forestry and fishing

1222 Production and operations department managers in manufacturing

1223 Production and operations department managers in construction

1224 Production and operations department managers in wholesale and retail trade

1225 Production and operations department managers in restaurants and hotels

1226 Production and operations department managers in transport, storage and communications
1227 Production and operations department managers in business services.
1228 Production and operations department managers in personal care, cleaning and related services.
1229 Production and operations department managers not elsewhere classified.

123 OTHER DEPARTMENT MANAGERS
1231 Finance and administration department managers.
1232 Personnel and industrial relations department managers.
1233 Sales and marketing department managers.
1234 Advertising and public relations department managers.
1235 Supply and distribution department managers.
1236 Computing services department managers.
1237 Research and development department managers.
1239 Other department managers not elsewhere classified.

13 GENERAL MANAGERS (This group is intended to include persons who manage enterprises, or in some cases organisations, on their own behalf, or on behalf of the proprietor, with some non-managerial help and the assistance of no more than one other manager who should also be classified in this sub-major group as, in most cases, the tasks will be broader than those of a specialised manager in a larger enterprise or organisation. Non-managerial staff should be classified according to their specific tasks.

131 GENERAL MANAGERS
1311 General managers in agriculture, hunting, forestry/ and fishing.
1312 General managers in manufacturing.
1313 General managers in construction.
1314 General managers in wholesale and retail trade.
1315 General managers of restaurants and hotels.
1316 General managers in transport, storage and communications.
1317 General managers of business services.
1318 General managers in personal care, cleaning and related services.
MAJOR GROUP 2: PROFESSIONALS

21 PHYSICAL, MATHEMATICAL AND ENGINEERING SCIENCE PROFESSIONALS

211 PHYSICISTS, CHEMISTS AND RELATED PROFESSIONALS

2111 Physicists and astronomers

2112 Meteorologists

2113 Chemists

2114 Geologists and geophysicists

212 MATHEMATICIANS, STATISTICIANS AND RELATED PROFESSIONALS

2121 Mathematicians and related professionals

2122 Statisticians

213 COMPUTING PROFESSIONALS

2131 Computer systems designers and analysts

2132 Computer programmers

2139 Computing professionals not elsewhere classified

214 ARCHITECTS, ENGINEERS AND RELATED PROFESSIONALS

2141 Architects, town and traffic planners

2142 Civil engineers

2143 Electrical engineers

2144 Electronics and telecommunications engineers

2145 Mechanical engineers

2146 Chemical engineers

2147 Mining engineers, metallurgists and related professionals

2148 Cartographers and surveyors

2149 Architects, engineers and related professionals not elsewhere classified
22 LIFE SCIENCE AND HEALTH PROFESSIONALS

221 LIFE SCIENCE PROFESSIONALS

2211 Biologists, botanists, zoologists and related professionals

2212 Pharmacologists, pathologists and related professionals

2213 Agronomists and related professionals

222 HEALTH PROFESSIONALS (except nursing)

2221 Medical doctors

2222 Dentists

2223 Veterinarians

2224 Pharmacists

2229 Health professionals (except nursing) not elsewhere classified

223 NURSING AND MIDWIFERY PROFESSIONALS

2230 Nursing and midwifery professionals

23 TEACHING PROFESSIONALS

231 COLLEGE, UNIVERSITY AND HIGHER EDUCATION TEACHING PROFESSIONALS

2310 College, university and higher education teaching professionals

232 SECONDARY EDUCATION TEACHING PROFESSIONALS

2320 Secondary education teaching professionals

233 PRIMARY AND PRE-PRIMARY EDUCATION TEACHING PROFESSIONALS

2331 Primary education teaching professionals

2332 Pre-primary education teaching professionals

234 SPECIAL EDUCATION TEACHING PROFESSIONALS

2340 Special education teaching professionals

235 OTHER TEACHING PROFESSIONALS

2351 Education methods specialists
2352 School inspectors
2359 Other teaching professionals not elsewhere classified

24 OTHER PROFESSIONALS

241 BUSINESS PROFESSIONALS

2411 Accountants
2412 Personnel and careers professionals
2419 Business professionals not elsewhere classified

242 LEGAL PROFESSIONALS

2421 Lawyers
2422 Judges
2429 Legal professionals not elsewhere classified

243 ARCHIVISTS, LIBRARIANS AND RELATED INFORMATION PROFESSIONALS

2431 Archivists and curators
2432 Librarians and related information professionals

244 SOCIAL SCIENCE AND RELATED PROFESSIONALS

2441 Economists
2442 Sociologists, anthropologists and related professionals
2443 Philosophers, historians and political scientists
2444 Philologists, translators and interpreters
2445 Psychologists
2446 Social work professionals

245 WRITERS AND CREATIVE OR PERFORMING ARTISTS

2451 Authors, journalists and other writers
2452 Sculptors, painters and related artists
2453 Composers, musicians and singers
2454 Choreographers and dancers
2455 Film, stage and related actors and directors
246 RELIGIOUS PROFESSIONALS
2460 Religious professionals.

MAJOR GROUP 3: TECHNICIANS AND ASSOCIATE PROFESSIONALS

31 PHYSICAL AND ENGINEERING SCIENCE ASSOCIATE PROFESSIONALS

311 PHYSICAL AND ENGINEERING SCIENCE TECHNICIANS

3111 Chemical and physical science technicians
3112 Civil engineering technicians
3113 Electrical engineering technicians
3114 Electronics and telecommunications engineering technicians
3115 Mechanical engineering technicians
3116 Chemical engineering technicians
3117 Mining and metallurgical technicians
3118 Draughtspersons
3119 Physical and engineering science technicians not elsewhere classified

312 COMPUTER ASSOCIATE PROFESSIONALS

3121 Computer assistants
3122 Computer equipment operators
3123 Industrial robot controllers

313 OPTICAL AND ELECTRONIC EQUIPMENT OPERATORS

3131 Photographers and image and sound recording equipment operators
3132 Broadcasting and telecommunications equipment operators
3133 Medical equipment operators
3139 Optical and electronic equipment operators not elsewhere classified
314 SHIP AND AIRCRAFT CONTROLLERS AND TECHNICIANS

3141 Ships' engineers

3142 Ships' deck officers and pilots

3143 Aircraft pilots and related associate professionals

3144 Air traffic controllers

3145 Air traffic safety technicians

315 SAFETY AND QUALITY INSPECTORS

3151 Building and fire inspectors

3152 Safety, health and quality inspectors

32 LIFE SCIENCE AND HEALTH ASSOCIATE PROFESSIONALS

321 LIFE SCIENCE TECHNICIANS AND RELATED ASSOCIATE PROFESSIONALS

3211 Life science technicians

3212 Agronomy and forestry technicians

3213 Farming and forestry advisers

322 MODERN HEALTH ASSOCIATE PROFESSIONALS (except nursing)

3221 Medical assistants

3222 Sanitarians

3223 Dieticians and nutritionists

3224 Optometrists and opticians

3225 Dental assistants

3226 Physiotherapists and related associate professionals

3227 Veterinary assistants

3228 Pharmaceutical assistants

3229 Modern health associate professionals (except nursing) not elsewhere classified

323 NURSING AND MIDWIFERY ASSOCIATE PROFESSIONALS
3231 Nursing associate professionals
3232 Midwifery associate professionals
324 TRADITIONAL MEDICINE PRACTITIONERS AND FAITH HEALERS
3241 Traditional medicine practitioners
3242 Faith healers
33 TEACHING ASSOCIATE PROFESSIONALS
331 PRIMARY EDUCATION TEACHING ASSOCIATE PROFESSIONALS
3310 Primary education teaching associate professionals
332 PRE-PRIMARY EDUCATION TEACHING ASSOCIATE PROFESSIONALS
3320 Pre-primary education teaching associate professionals
333 SPECIAL EDUCATION TEACHING ASSOCIATE PROFESSIONALS
3330 Special education teaching associate professionals
334 OTHER TEACHING ASSOCIATE PROFESSIONALS
3340 Other teaching associate professionals
34 OTHER ASSOCIATE PROFESSIONALS
341 FINANCE AND SALES ASSOCIATE PROFESSIONALS
3411 Securities and finance dealers and brokers
3412 Insurance representatives
3413 Estate agents
3414 Travel consultants and organisers
3415 Technical and commercial sales representatives
3416 Buyers
3417 Appraisers, valuers and auctioneers
3419 Finance and sales associate professionals not elsewhere classified
342 BUSINESS SERVICES AGENTS AND TRADE BROKERS
3421 Trade brokers
3422 Clearing and forwarding agents
3423 Employment agents and labour contractors
3429 Business services agents and trade brokers not elsewhere classified
343 ADMINISTRATIVE ASSOCIATE PROFESSIONALS
3431 Administrative secretaries and related associate professionals
3432 Legal and related business associate professionals
3433 Bookkeepers
3434 Statistical, mathematical and related associate professionals
3439 Administrative associate professionals not elsewhere classified
344 CUSTOMS, TAX AND RELATED GOVERNMENT ASSOCIATE PROFESSIONALS
3441 Customs and border inspectors
3442 Government tax and excise officials
3443 Government social benefits officials
3444 Government licensing officials
3449 Customs, tax and related government associate professionals not elsewhere classified
345 POLICE INSPECTORS AND DETECTIVES
3450 Police inspectors and detectives
346 SOCIAL WORK ASSOCIATE PROFESSIONALS
3460 Social work associate professionals
347 ARTISTIC, ENTERTAINMENT AND SPORTS ASSOCIATE PROFESSIONALS
3471 Decorators and commercial designers
3472 Radio, television and other announcers
3473 Street, night-club and related musicians, singers and dancers
3474 Clowns, magicians, acrobats and related associate professionals
3475 Athletes, sportspersons and related associate professionals

348 RELIGIOUS ASSOCIATE PROFESSIONALS

3480 Religious associate professionals

MAJOR GROUP 4: CLERKS

41 OFFICE CLERKS

411 SECRETARIES AND KEYBOARD-OPERATING CLERKS

4111 Stenographers and typists

4112 Word-processor and related operators

4113 Data entry operators

4114 Calculating-machine operators

4115 Secretaries

412 NUMERICAL CLERKS

4121 Accounting and bookkeeping clerks

4122 Statistical and finance clerks

413 MATERIAL-RECORDING AND TRANSPORT CLERKS

4131 Stock clerks

4132 Production clerks

4133 Transport clerks

414 LIBRARY, MAIL AND RELATED CLERKS

4141 Library and filing clerks

4142 Mail carriers and sorting clerks

4143 Coding, proof-reading and related clerks

4144 Scribes and related workers

419 OTHER OFFICE CLERKS

4190 Other office clerks
42 CUSTOMER SERVICES CLERKS
421 CASHIERS, TELLERS AND RELATED CLERKS
4211 Cashiers and ticket clerks
4212 Tellers and other counter clerks
4213 Bookmakers and croupiers
4214 Pawnbrokers and money-lenders
4215 Debt-collectors and related workers
422 CLIENT INFORMATION CLERKS
4221 Travel agency and related clerks
4222 Receptionists and information clerks
4223 Telephone switchboard operators

MAJOR GROUP 5 : SERVICE WORKERS AND SHOP AND MARKET SALES WORKERS
51 PERSONAL AND PROTECTIVE SERVICES WORKERS
511 TRAVEL ATTENDANTS AND RELATED WORKERS
5111 Travel attendants and travel stewards
5112 Transport conductors
5113 Travel guides
512 HOUSEKEEPING AND RESTAURANT SERVICES WORKERS
5121 Housekeepers and related workers
5122 Cooks
5123 Waiters, waitresses and bartenders
513 PERSONAL CARE AND RELATED WORKERS
5131 Child-care workers
5132 Institution-based personal care workers
5133 Home-based personal care workers
5139 Personal care and related workers not elsewhere classified

514 OTHER PERSONAL SERVICES WORKERS
5141 Hairdressers, barbers, beauticians and related workers
5142 Companions and valets
5143 Undertakers and embalmers
5149 Other personal services workers not elsewhere classified

515 ASTROLOGERS, FORTUNE-TELLERS AND RELATED WORKERS
5151 Astrologers and related workers
5152 Fortune-tellers, palmists and related workers

516 PROTECTIVE SERVICES WORKERS
5161 Fire-fighters
5162 Police officers
5163 Prison guards
5169 Protective services workers not elsewhere classified

52 MODELS, SALESPERSONS AND DEMONSTRATORS
521 FASHION AND OTHER MODELS
5210 Fashion and other models

522 SHOP SALESPERSONS AND DEMONSTRATORS
5220 Shop salespersons and demonstrators

523 STALL AND MARKET SALESPERSONS
5230 Stall and market salespersons

MAJOR GROUP 6: SKILLED AGRICULTURAL AND FISHERY WORKERS

61 MARKET-ORIENTED SKILLED AGRICULTURAL AND FISHERY WORKERS
611 MARKET GARDENERS AND CROP GROWERS
6111 Field crop and vegetable growers
612 MARKET-ORIENTED ANIMAL PRODUCERS AND RELATED WORKERS
6121 Dairy and livestock producers
6122 Poultry producers
6123 Apiarists and sericulturists
6124 Mixed-animal producers
6129 Market-oriented animal producers and related workers not elsewhere classified

613 MARKET-ORIENTED CROP AND ANIMAL PRODUCERS
6130 Market-oriented crop and animal producers

614 FORESTRY AND RELATED WORKERS
6141 Forestry workers and loggers
6142 Charcoal burners and related workers

615 FISHERY WORKERS, HUNTERS AND TRAPPERS
6151 Aquatic-life cultivation workers
6152 Inland and coastal waters fishery workers
6153 Deep-sea fishery workers
6154 Hunters and trappers

62 SUBSISTENCE AGRICULTURAL AND FISHERY WORKERS
621 SUBSISTENCE AGRICULTURAL AND FISHERY WORKERS
6210 Subsistence agricultural and fishery workers

MAJOR GROUP 7 : CRAFT AND RELATED TRADES WORKERS
71 EXTRACTION AND BUILDING TRADES WORKERS
711 MINERS, SHOTFIREFERS, STONE CUTTERS AND CARVERS
7111 Miners and quarry workers
7112 Shotfirers and blasters
7113 Stone splitters, cutters and carvers

712 BUILDING FRAME AND RELATED TRADES WORKERS
7121 Builders, traditional materials
7122 Bricklayers and stonemasons
7123 Concrete placers, concrete finishers and related workers
7124 Carpenters and joiners
7129 Building frame and related trades workers not elsewhere classified

713 BUILDING FINISHERS AND RELATED TRADES WORKERS
7131 Roofers
7132 Floor layers and tile setters
7133 Plasterers
7134 Insulation workers
7135 Glaziers
7136 Plumbers and pipe fitters
7137 Building and related electricians

714 PAINTERS, BUILDING STRUCTURE CLEANERS AND RELATED TRADES WORKERS
7141 Painters and related workers
7142 Varnishers and related painters
7143 Building structure cleaners

72 METAL, MACHINERY AND RELATED TRADES WORKERS
721 METAL MOULDERS, WELDERS, SHEET-METAL WORKERS, STRUCTURAL- METAL PREPARERS, AND RELATED TRADES WORKERS
7211 Metal moulders and coremakers
7212 Welders and flamecutters
7213 Sheet metal workers
7214 Structural-metal preparers and erectors
7215 Riggers and cable splicers
7216 Underwater workers

722 BLACKSMITHS, TOOL-MAKERS AND RELATED TRADES WORKERS
7221 Blacksmiths, hammer-smiths and forging-press workers
7222 Tool-makers and related workers
7223 Machine-tool setters and setter-operators
7224 Metal wheel-grinders, polishers and tool sharpeners

723 MACHINERY MECHANICS AND FITTERS
7231 Motor vehicle mechanics and fitters
7232 Aircraft engine mechanics and fitters
7233 Agricultural- or industrial-machinery mechanics and fitters

724 ELECTRICAL AND ELECTRONIC EQUIPMENT MECHANICS AND FITTERS
7241 Electrical mechanics and fitters
7242 Electronics fitters
7243 Electronics mechanics and servicers
7244 Telegraph and telephone installers and servicers
7245 Electrical line installers, repairers and cable jointers

73 PRECISION, HANDICRAFT, PRINTING AND RELATED TRADES WORKERS
731 PRECISION WORKERS IN METAL AND RELATED MATERIALS
7311 Precision-instrument makers and repairers
7312 Musical instrument makers and tuners
7313 Jewellery and precious-metal workers
732 POTTERS, GLASS-MAKERS AND RELATED TRADES WORKERS

7321 Abrasive wheel formers, potters and related workers

7322 Glass makers, cutters, grinders and finishers

7323 Glass engravers and etchers

7324 Glass, ceramics and related decorative painters

733 HANDICRAFT WORKERS IN WOOD, TEXTILE, LEATHER AND RELATED MATERIALS

7331 Handicraft workers in wood and related materials

7332 Handicraft workers in textile, leather and related materials

734 PRINTING AND RELATED TRADES WORKERS

7341 Compositors, typesetters and related workers

7342 Stereotypers and electrotypers

7343 Printing engravers and etchers

7344 Photographic and related workers

7345 Bookbinders and related workers

7346 Silk-screen, block and textile printers

74 OTHER CRAFT AND RELATED TRADES WORKERS

741 FOOD PROCESSING AND RELATED TRADES WORKERS

7411 Butchers, fishmongers and related food preparers

7412 Bakers, pastry-cooks and confectionery makers

7413 Dairy-products makers

7414 Fruit, vegetable and related preservers

7415 Food and beverage tasters and graders

7416 Tobacco preparers and tobacco products makers

742 WOOD TREATERS, CABINET-MAKERS AND RELATED TRADES WORKERS

7421 Wood treaters
7422 Cabinet makers and related workers
7423 Woodworking machine setters and setter-operators
7424 Basketry weavers, brush makers and related workers
743 TEXTILE, GARMENT AND RELATED TRADES WORKERS
7431 Fibre preparers
7432 Weavers, knitters and related workers
7433 Tailors, dressmakers and hatters
7434 Furriers and related workers
7435 Textile, leather and related pattern-makers and cutters
7436 Sewers, embroiderers and related workers
7437 Upholsterers and related workers
744 PELT, LEATHER AND SHOEMAKING TRADES WORKERS
7441 Pelt dressers, tanners and fellmongers
7442 Shoe-makers and related workers

MAJOR GROUP 8 : PLANT AND MACHINE OPERATORS AND ASSEMBLERS

81 STATIONARY-PLANT AND RELATED OPERATORS

811 MINING- AND MINERAL-PROCESSING-PLANT OPERATORS

8111 Mining-plant operators
8112 Mineral-ore- and stone-processing-plant operators
8113 Well drillers and borers and related workers

812 METAL-PROCESSING-PLANT OPERATORS

8121 Ore and metal furnace operators
8122 Metal melters, casters and rolling-mill operators
8123 Metal-heat-treating-plant operators
8124 Metal drawers and extruders
813 GLASS, CERAMICS AND RELATED PLANT OPERATORS
8131 Glass and ceramics kiln and related machine operators
8139 Glass, ceramics and related plant operators not elsewhere classified
814 WOOD-PROCESSING- AND PAPERMAKING-PLANT OPERATORS
8141 Wood-processing-plant operators
8142 Paper-pulp plant operators
8143 Papermaking-plant operators
815 CHEMICAL-PROCESSING-PLANT OPERATORS
8151 Crushing-, grinding- and chemical-mixing-machinery operators
8152 Chemical-heat-treating-plant operators
8153 Chemical-filtering- and separating-equipment operators
8154 Chemical-still and reactor operators (except petroleum and natural gas)
8155 Petroleum- and natural-gas-refining-plant operators
8159 Chemical-processing-plant operators not elsewhere classified
816 POWER-PRODUCTION AND RELATED PLANT OPERATORS
8161 Power-production plant operators
8162 Steam-engine and boiler operators
8163 Incinerator, water-treatment and related plant operators
817 AUTOMATED-ASSEMBLY-LINE AND INDUSTRIAL-ROBOT OPERATORS
8171 Automated-assembly-line operators
8172 Industrial-robot operators
82 MACHINE OPERATORS AND ASSEMBLERS
821 METAL- AND MINERAL-PRODUCTS MACHINE OPERATORS
8211 Machine-tool operators
8212 Cement and other mineral products machine operators
822 CHEMICAL-PRODUCTS MACHINE OPERATORS
8221 Pharmaceutical- and toiletry-products machine operators
8222 Ammunition- and explosive-products machine operators
8223 Metal finishing-, plating- and coating-machine operators
8224 Photographic-products machine operators
8229 Chemical-products machine operators not elsewhere classified
823 RUBBER- AND PLASTIC-PRODUCTS MACHINE OPERATORS
8231 Rubber-products machine operators
8232 Plastic-products machine operators
824 WOOD-PRODUCTS MACHINE OPERATORS
8240 Wood-products machine operators
825 PRINTING-, BINDING- AND PAPER-PRODUCTS MACHINE OPERATORS
8251 Printing-machine operators
8252 Bookbinding-machine operators
8253 Paper-products machine operators
826 TEXTILE-, FUR- AND LEATHER-PRODUCTS MACHINE OPERATORS
8261 Fibre-preparing-, spinning- and winding-machine operators
8262 Weaving- and knitting-machine operators
8263 Sewing-machine operators
8264 Bleaching-, dyeing- and cleaning-machine operators
8265 Fur and leather-preparing-machine operators
8266 Shoemaking- and related machine operators
8269 Textile-, fur- and leather-products machine operators not elsewhere classified
827 FOOD AND RELATED PRODUCTS MACHINE OPERATORS
8271 Meat- and fish-processing-machine operators
8272 Dairy-products machine operators
8273 Grain- and spice-milling-machine operators
8274 Baked-goods, cereal and chocolate-products machine operators
8275 Fruit-, vegetable- and nut-processing-machine operators
8276 Sugar production machine operators
8277 Tea-, coffee-, and cocoa-processing-machine operators
8278 Brewers, wine and other beverage machine operators
8279 Tobacco production machine operators
828 ASSEMBLERS
8281 Mechanical-machinery assemblers
8282 Electrical-equipment assemblers
8283 Electronic-equipment assemblers
8284 Metal-, rubber- and plastic-products assemblers
8285 Wood and related products assemblers
8286 Paperboard, textile and related products assemblers
829 OTHER MACHINE OPERATORS AND ASSEMBLERS
8290 Other machine operators and assemblers
83 DRIVERS AND MOBILE-PLANT OPERATORS
831 LOCOMOTIVE-ENGINE DRIVERS AND RELATED WORKERS
8311 Locomotive-engine drivers
8312 Railway brakers, signallers and shunters
832 MOTOR-VEHICLE DRIVERS
8321 Motor-cycle drivers
8322 Car, taxi and van drivers
8323 Bus and tram drivers
8324 Heavy-truck and lorry drivers

833 AGRICULTURAL AND OTHER MOBILE-PLANT OPERATORS

8331 Motorised farm and forestry plant operators
8332 Earth-moving- and related plant operators
8333 Crane, hoist and related plant operators
8334 Lifting-truck operators

834 SHIPS' DECK CREWS AND RELATED WORKERS

8340 Ships' deck crews and related workers

MAJOR GROUP 9 : ELEMENTARY OCCUPATIONS

91 SALES AND SERVICES ELEMENTARY OCCUPATIONS

911 STREET VENDORS AND RELATED WORKERS

9111 Street food vendors
9112 Street vendors, non-food products
9113 Door-to-door and telephone salespersons

912 SHOE CLEANING AND OTHER STREET SERVICES ELEMENTARY OCCUPATIONS

9120 Shoe cleaning and other street services elementary occupations

913 DOMESTIC AND RELATED HELPERS, CLEANERS AND LAUNDERERS

9131 Domestic helpers and cleaners
9132 Helpers and cleaners in offices, hotels and other establishments
9133 Hand-launderers and pressers

914 BUILDING CARETAKERS, WINDOW AND RELATED CLEANERS

9141 Building caretakers
9142 Vehicle, window and related cleaners

915 MESSENGERS, PORTERS, DOORKEEPERS AND RELATED WORKERS

9151 Messengers, package and luggage porters and deliverers
9152 Doorkeepers, watchpersons and related workers
9153 Vending-machine money collectors, meter readers and related workers
916 GARBAGE COLLECTORS AND RELATED LABOURERS
9161 Garbage collectors
9162 Sweepers and related labourers
92 AGRICULTURAL, FISHERY AND RELATED LABOURERS
921 AGRICULTURAL, FISHERY AND RELATED LABOURERS
9211 Farm-hands and labourers
9212 Forestry labourers
9213 Fishery, hunting and trapping labourers
93 LABOURERS IN MINING, CONSTRUCTION, MANUFACTURING AND TRANSPORT
931 MINING AND CONSTRUCTION LABOURERS
9311 Mining and quarrying labourers
9312 Construction and maintenance labourers: roads, dams and similar constructions
9313 Building construction labourers
932 MANUFACTURING LABOURERS
9321 Assembling labourers
9322 Hand packers and other manufacturing labourers
933 TRANSPORT LABOURERS AND FREIGHT HANDLERS
9331 Hand or pedal vehicle drivers
9332 Drivers of animal-drawn vehicles and machinery
9333 Freight handlers

MAJOR GROUP 0 : ARMED FORCES
01 ARMED FORCES 011 ARMED FORCES 0110 Armed forces