

## Compliance of INVENTEO with the AMIRA code P754



As an introduction it must be reminded that the application of the AMIRA code P754 is not only linked to the use of a given software, whatever qualities it may get or functionalities it may provide. The software package will facilitate to reach the code recommendation but is not sufficient.

It must be underlined that implementing an accurate and reliable metal accounting system, first relies on the involvement of the whole company, including the top management, the financial division, the quality insurance team and the production and laboratory teams, all actors being ready to participate, at different level to the implementation.

The starting point of an efficient system is an accurate sampling and measurement system. It is common to say about metal accounting software that if bad data are sent in the software, inaccurate results will be obtained, often summarized as: “Garbage in, garbage out”.

Once this introduction given, the recommendations of the P754 Amira code can be summarized in ten main principles that INVENTEO allows or helps to apply.

***1. The metal accounting system must be based on accurate measurements of mass and metal content. It must be based on a full Check in-Check out system using the Best Practices as defined in this Code, to produce an on-going metal/commodity balance for the operation. The system must be integrated with management information systems, providing a one-way transfer of information to these systems as required.***

The INVENTEO solution is fully integrated in the plant information system, communicating in a single way for collecting raw data in the existing databases, and saving processed data in its own database. Not any duplication of data is never done. The data reconciliation algorithm, embedded in the solution, allows a full Check-in Check-out system. The implementation project includes an audit of the measurement system for mass and analysis, including the sampling system.



*2. The system must be consistent and transparent and the source of all input data to the system must be clear and understood by all users of the system. The design and specification of the system must incorporate the outcomes of a risk assessment of all aspects of the metal accounting process.*

Before the implementation of INVENTEO, a full audit of the information system is made. Recommendations are made for a better management and assistance is provided for defining and writing the data management procedure, including the assumption of possible risk at each level of the information system.

For each metal accounting variable, a generation report clearly displays the set of raw input data as well as the method for obtaining and processing it. This report can be viewed by any user of the system.

*3. The accounting procedures must be well documented and user friendly for easy application by plant personnel, to avoid the system becoming dependent on one person, and must incorporate clear controls and audit trails. Calculation procedures must be in line with the requirements set out in this Code and consistent at all times with clear rules for handling the data.*

CASPEO provides documentation for INVENTEO as well as detailed documentation of the specific development that can be done. A detailed configuration report is also provided, explaining the calculation procedure for each variable. Training courses are animated so that a group of people share the competencies for each level of use of the application: administration, modelling (configuration) and metal accounting. Crossed checking by the members of each group are encouraged and CASPEO assists the client in the definition and writing of such procedure.

*4. The system must be subject to regular internal and external audits and reviews as specified in the relevant sections of the Code to ensure compliance with all aspects of the defined procedures. These reviews must include assessments of the associated risks and recommendations for their mitigation, when the agreed risk is exceeded.*

CASPEO assist the client in the definition and writing of all type of procedures so that they are applicable and that their objectives remain ambitious but reachable. INVENTEO offers a set of tools facilitating checking data and calculated results. A traceability of any user input is ensured and can be verified by internal or external audit.

*5. Accounting results must be made available timeously, to meet operational reporting needs, including the provision of information for other management information systems, and to facilitate corrective action or investigation. A detailed report must be issued on each investigation, together with management's response to rectify the problem. When completed, the plan and resulting action must be signed-off by the Competent Person.*

INVENTEO, automating a large amount of data processing tasks allow a reduction of the necessary time for establishing periodic metal accounting. It also allows the generation of different types of reports, designed for the different actors of the plant. A complete one, including all the details of the period, including possible corrective actions can be established. Through its administration functions, managing identification and rights of users, INVENTEO allows the traceability of modifications and impose justification input.

*6. Where provisional data has to be used to meet reporting deadlines, such as at month ends when analytical turn-around times could prevent the prompt issuing of the monthly report, clear procedures and levels of authorisation for the subsequent replacement of the provisional data with actual data must be defined. Where rogue data is detected, such as incorrect data transfer or identified malfunction of equipment, the procedures to be followed together with the levels of authorisation must be in place.*

INVENTEO allows an easy management of different scenarios, such as the use of provisional data. It allows the storage and traceability of all the intermediate and final results with all the associated comments. A workflow tool can be activated to manage the approbation circuit. Corresponding procedures are then detailed in the documentation.

*7. The system must generate sufficient data to allow for data verification, the handling of metal/commodity transfers, the reconciliation of metal/commodity balances, and the measurement of accuracies and error detection, which should not show any consistent bias. Measurement and computational procedures must be free of a defined critical level of bias.*

The sampling and measurement audit carried out within the frame of the INVENTEO implementation assess the necessary quantity of data is available. The accuracies are calculated, and an analysis tool is available for data and results checking. Gross errors are detected, and large inconsistencies errors are identified through a colour code.

*8. Target accuracies for the mass measurements and the sampling and analyses must be identified for each input and output stream used for accounting purposes. The actual accuracies for metal recoveries, based on the actual accuracies, as determined by statistical analysis of the raw data, achieved over a company's reporting period must be stated in the report to the Company's Audit Committee. Should these show a bias that the Company considers material to its results, the fact must be reported to shareholders.*

The accuracy of the reconciled data (including recovery) are calculated based on the accuracy of individual measurements. The data analysis tool available in INVENTEO allows the identification of discrepancies between the target accuracies and the obtained ones. Dedicated reports can be established.

*9. In-process inventory figures must be verified by physical stock-takes at prescribed intervals, at least annually, and procedures and authority levels for stock adjustments and the treatment of unaccounted losses or gains must be clearly defined.*

During the scoping study of the implementation project, a special attention is paid to stock management. Recommendations are made in terms of estimation methods. Periodic stock-takes are also scheduled and written in the manual of procedures.

*10. The metal accounting system must ensure that every effort is made to identify any bias that may occur, as rapidly as possible and eliminate or reduce to an acceptable level the source of bias from all measurement, sampling and analytical procedures, when the source is identified.*

As INVENTEO reduces the data treatment time, identifies discrepancies between target accuracies and real ones, fast reactions can occur for identifying the source and solving any problem as soon as detected. At each stage of the calculation, intermediate results are submitted to checking before validation and operation of the next step.

To summarize, INVENTEO compliance following the 10 AMIRA principles

Principles	INVENTEO compliance
1. Integrated, on-going and accurate system	✓
2. Transparent system	✓
3. Documentated system	✓
4. Auditable system	✓
5. Timeliness	✓
6. Use of provisional data	✓
7. Data validation and redundancy	✓
8. Target accuracies	✓
9. In-process inventory	✓
10. Bias detection	✓



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