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Coupling innovative sensors, process modelling and data analysis for the improvement of EAF performances and sustainability of steel production for Acciaierie di Calvisano

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The necessity to improve the EAF process performances and its sustainability are becoming more and more relevant id last years for several reasons.
In fact the increase of steel production rates through EAF instead of BF enlarging the application of EAF to further steel grades and the necessity to apply the EAF process also with lower quality scraps both increase the impact of EAF technology development in terms of Industrial results (productivity, metallic yield, costs) and of environmental Impacts (energy/materials efficiency and CO2 emissions) at EU level.
Furthermore the evidence that the reduction of CO2 emissions by EAF is affected strongly by reduction of energy consumption and by increasing of metallic yield, the opportunities offered by the flexibility of EAF process management that enable the possibility to apply new control rules evaluating in real time their benefits, the availability of new technologies and new materials for additions in EAF enable the necessity to take into account new chemical scenarios and new management procedures for process improvements.
With this scope to support the process management it has been realized a great effort to enable the application of new devices and new sensors to make available new measurement principles to cover part of the missing data during the process.
In parallel in last decades several steps have been realized in terms of process modelling and calculation capabilities in order to have a better representation in off-line mode (predictive modelling) and in on-line mode (real time digital twin) in order to have a technological monitoring of the unknown and not measurable parameters as temperatures, compositions, quantities of steel and slags during the process to complete the whole representations of the process supporting the technologists and operators.
Acciaierie di Calvisano has realized the coupling of these items, modelling and sensors developments, in order to improve capabilities of process management and thanks to this it have been developed specific new control rules devoted to represent specific technological phenomena to be controlled as key aspects to reach the goal of process improvement.
These aactivities of Acciaierie di Calvisano are described as realized also in R&D projects as MultisensEAF and islag with the support of R&D partners and thanks to the increase of internal skills about capability of process modelling and control.

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