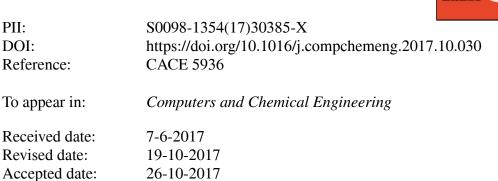
## Accepted Manuscript

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Please cite this article as: Lotero, Irene., Gopalakrishnan, Ajit., & Roba, Thierry., On improving the online performance of Production Scheduling: Application to Air Separation Units.*Computers and Chemical Engineering* https://doi.org/10.1016/j.compchemeng.2017.10.030

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# ACCEPTED MANUSCRIPT

### FOCAPO/CPC 2017

## **On improving the online performance of Production Scheduling: Application to Air Separation Units**

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#### Abstract

In the operation of power-intensive Air Separation Units (ASUs) that produce storable liquid products, optimization opportunities exist at two time scales - week-ahead production scheduling to leverage fluctuations in electricity prices, and real-time decisions that optimize the entire plant operation and capture spot opportunities. In our previous work, we proposed a methodology based on flexibility analysis and robust optimization to ensure feasibility of real-time operational decisions at ASUs for future time periods within a scheduling horizon. In this paper, we build upon the methodology to propose approaches to improve the online performance of a production schedule for ASUs by using the real-time optimization layer. We compare several policies for real-time optimization and our studies on real plant data show interesting trade-offs between week-ahead scheduling and real-time optimization.

Keywords: online scheduling, real-time optimization, decisions under uncertainty, industrial challenges

#### Nomenclature

Indices	
<i>i</i> Products	
t time periods	
<i>k</i> a specific time period	
<i>j</i> constraints defining the production	space

Sets

Ι	Products
Т	time periods in scheduling horizon, $T = \{1, 2,, t^{fin}\}$
$\overline{T}$	time periods before the scheduling horizon, $\overline{T} = \{-\theta + 1, -\theta + 2,, 0\}$
J	constraints defining the production space

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