

## RDZ Protected Start-up Program

This document provides the recommended start-up program for RZD Protected and NCN Protected rings. Following the prescribed sequence of spindle speeds and traveler changes helps ensure optimum ring performance and extended traveler life.

| Phase | Spindle speed      | Traveler change duration <sup>1</sup> | Traveler number        | Notes                            |
|-------|--------------------|---------------------------------------|------------------------|----------------------------------|
| I     | 80% of final speed | 1 hour                                | 2 nr. heavier traveler | Rings cleaning <sup>2</sup>      |
|       | 80% of final speed | 1 doff                                | 2 nr. heavier traveler |                                  |
|       | 80% of final speed | 2 doffs                               | 2 nr. heavier traveler | Traveler inspection <sup>3</sup> |
| II    | 90% of final speed | 1 doff                                | 1 nr. heavier traveler |                                  |
|       | 90% of final speed | 2 doffs                               | 1 nr. heavier traveler |                                  |
|       | 90% of final speed | 4 doffs                               | 1 nr. heavier traveler |                                  |
|       | 90% of final speed | 8 doffs                               | 1 nr. heavier traveler | Traveler inspection <sup>3</sup> |
| III   | Final speed        | 1 doff                                | Normal traveler        |                                  |
|       | Final speed        | 2 doffs <sup>4</sup>                  | Normal traveler        | Traveler inspection <sup>3</sup> |
|       | Final speed        | 4 doffs                               | Normal traveler        |                                  |
|       | Final speed        | 8 doffs                               | Normal traveler        | Traveler inspection <sup>3</sup> |
|       | Final speed        | 12 doffs                              | Normal traveler        |                                  |
|       | Final speed        | 16 doffs                              | Normal traveler        | Traveler inspection <sup>3</sup> |
|       | Final speed        | 24 doffs                              | Normal traveler        |                                  |
|       | Final speed        | 32 doffs                              | Normal traveler        | Traveler inspection <sup>3</sup> |
|       | Final speed        | 40 doffs <sup>5</sup>                 | Normal traveler        | Traveler inspection <sup>3</sup> |

### Important notes:

<sup>1</sup> The traveler change must be done with full cops (not with empty tubes).

<sup>2</sup> Clean rings with a dry cotton cloth to remove dust accumulation.

<sup>3</sup> If the percentage of burnt travelers exceeds 5%, repeat the previous traveler change interval until the percentage of burnt travelers falls below 5%.

<sup>4</sup> From this step onward, and after every traveler change during normal production, reduce the spindle speed to 80% of the final speed for the first 30 minutes. This procedure helps extend traveler life.

<sup>5</sup> From this step onward, if the percentage of burnt travelers remains below 5%, the traveler replacement interval may be extended by 24 hours.