



result, all maintenance work has to be planned and organized well in advance, minimizing downtime and disruption to scheduling.

To accommodate this, the upgrade work, completed in 2022, was carried out over a three-week timeframe in three phases. This ensured that Ash Grove could use the unloader during the project, which also included fitting modern variable frequency drives (VFDs) to improve control of the unloader's movements. VFDs are very efficient and offer stepless speed control. In addition, the inlet feeder gear and electric motor were updated from direct current (DC) operation to alternating current (AC) with VFD-control.

Once complete, the upgraded unloader was commissioned, with the first vessel discharged under Bruks Siwertell's supervision.